

Indirect assessment of West Coast historical tidal wetland loss

PMEP Annual Meeting
Seattle, Washington, USA
October 2017



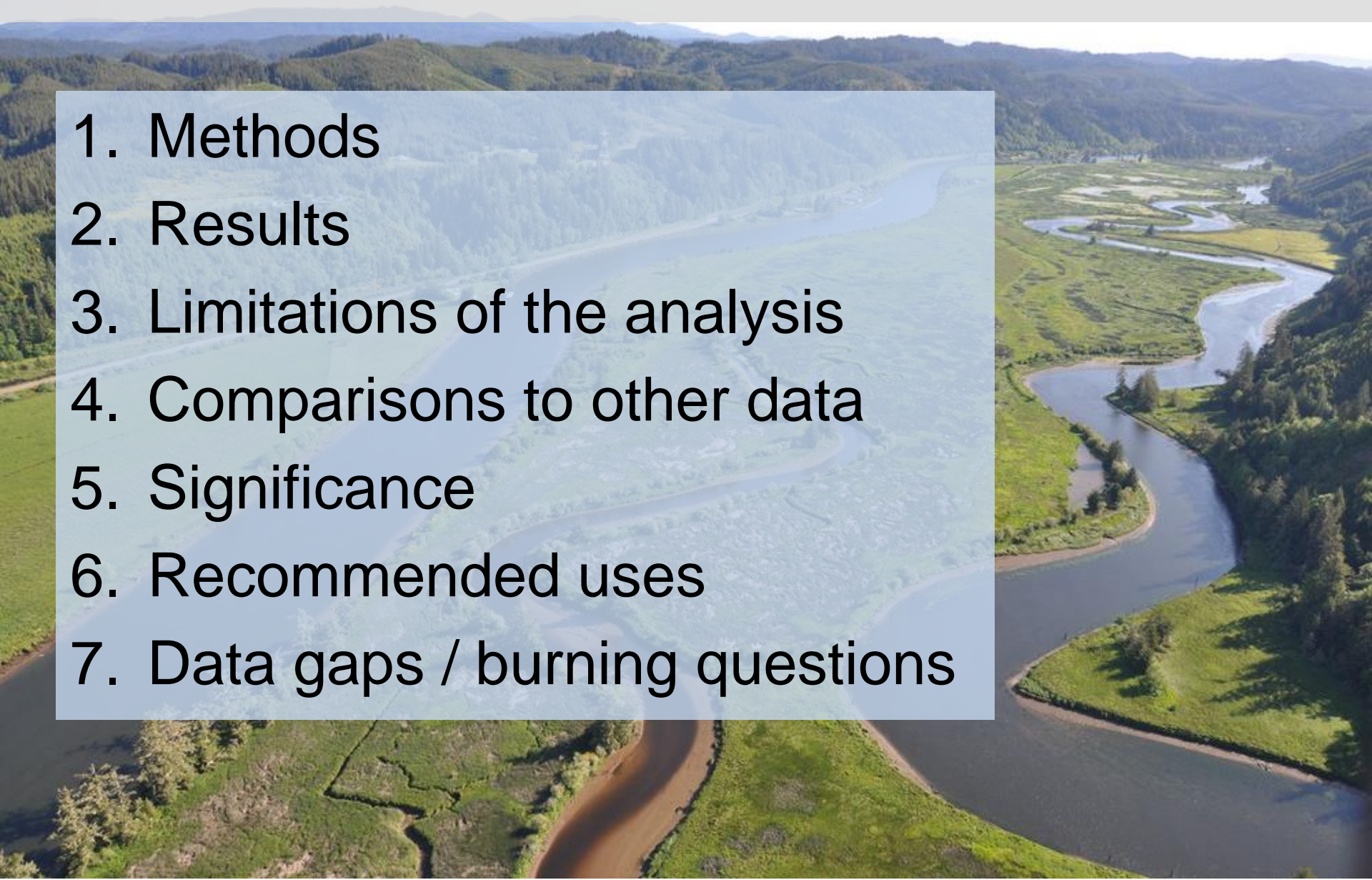
Laura Brophy¹, Brett Holycross², Van Hare²

¹ Estuary Technical Group, Institute for Applied Ecology

² Pacific States Marine Fisheries Commission

Outline

1. Methods
2. Results
3. Limitations of the analysis
4. Comparisons to other data
5. Significance
6. Recommended uses
7. Data gaps / burning questions



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Methods: Wetland types studied

Emergent
(tidal marsh)



Scrub-shrub
(tidal swamp)



Forested
(tidal swamp)



Methods: Central concept

1. PMEP's Estuary Extent layer maps historical and current tidal wetlands.*
2. Many of these are not currently tidal.
3. We can use the National Wetland Inventory (NWI) to help identify current tidal wetlands, i.e.:
All areas not identified in the NWI as current tidal wetlands can be considered “lost.”

*The Estuary Extent layer does not map areas filled above current tidal range, so it may underestimate historical extent in developed urban areas.

NWI analysis for tidal wetland loss determination

1. Areas that the NWI classifies as tidal are considered “retained.”
2. Areas the NWI classifies as nontidal are considered “lost.”
3. Non-vegetated areas are not analyzed, unless they were probably originally vegetated wetlands (such as diked salt ponds on former tidal marsh).

This is an “indirect assessment of West Coast historical tidal wetland loss”

Why is this an “indirect assessment?”

- Direct assessment would use mapping of disconnected areas (diked, tide gated, filled, etc.)
- No such mapping exists for the whole West Coast.
 - Most diked and disconnected wetlands are not attributed as such in NWI.
 - Only parts of the West Coast have comprehensive mapping of diked/disconnected areas (e.g. Oregon).
- Indirect assessment is a reasonable initial approach for broad geographic understanding.

NWI analysis for tidal wetland loss determination

620 NWI classifications within PMEP's Current and Historical Estuary Extent were reviewed and broadly grouped into categories:

1. Vegetated vs. non-vegetated
2. Tidal vs. nontidal water regime
3. Diked/drained/farmed vs. not diked/drained/farmed

NWI analysis for tidal wetland loss determination*

	Vegetated (EM, SS, or FO)				<u>Nonvegetated</u> or Aquatic Bed (UB, US, AB)			
	Nontidal water regime		Tidal water regime		Nontidal water regime		Tidal water regime	
NWI System	Diked/ drained/ farmed	Not diked/ drained/ farmed	Diked/ drained/ farmed	Not diked/ drained/ farmed	Diked/ drained/ farmed	Not diked/ drained/ farmed	Diked/ drained/ farmed	Not diked/ drained/ farmed
Marine								NA
Riverine				retained	NA	NA		NA
Estuarine	lost		lost	retained	lost		lost	NA
Palustrine	lost	lost	lost	retained	lost	lost	lost	NA
Lacustrine	lost	lost	lost	retained	lost	lost	lost	NA
None (uplands)	lost							

* This is a simplified table. For details, see the project report and metadata.

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3. Limitations of the analysis
4. Comparison to other data
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7. Data gaps / burning questions

Initial results

Initial stages of the analysis showed:

- Method works best in larger estuaries with substantial human alteration
- For smaller estuaries, scale of NWI data and NWI mapping methods limit usefulness of method

Therefore, we focused the analysis on estuaries with >100 ha historical tidal wetland area, and with substantial human alterations (55 estuaries).

Initial results

Initial stages of the analysis also showed that:

- Method underestimates loss in urbanized estuaries (because the Estuary Extent layer doesn't account for urban lands filled above tidal range)
- Method isn't suitable for lagoonal estuaries (see next slide)

Therefore, lagoonal estuaries were omitted from the analysis; and results highlight the likely underestimation of losses in urbanized estuaries.

Initial results

What about lagoonal estuaries?

- Maximum estuary extent may be a product of river flow and estuary closure, rather than high tides
- To account for this, Estuary Extent boundaries were determined using a combination of aerial photo interpretation and tidal datums
- Due to these different boundary determination methods, this study's loss assessment methods are less appropriate in lagoonal systems
- Losses are often the result of fill, which is not captured in PMEP's Estuary Extent (a known limitation)

Loss assessment results

	Historical tidal wetland area (ha)		
	Included in TWL analysis	Not included	Total
Estuary type			
Embayment/Bay	88,870	3,892	92,762
Major River Delta	180,856	829	181,685
Riverine Estuary	85,505	2,622	88,127
All types	355,230	7,344	362,574
% of total historical tidal wetland area	98%	2%	100%

- “Included in TWL analysis” are 55 non-lagoonal estuaries with historical tidal wetland area >100 ha and substantial human alterations.
- Lagoonal estuaries are omitted from the area figures above.

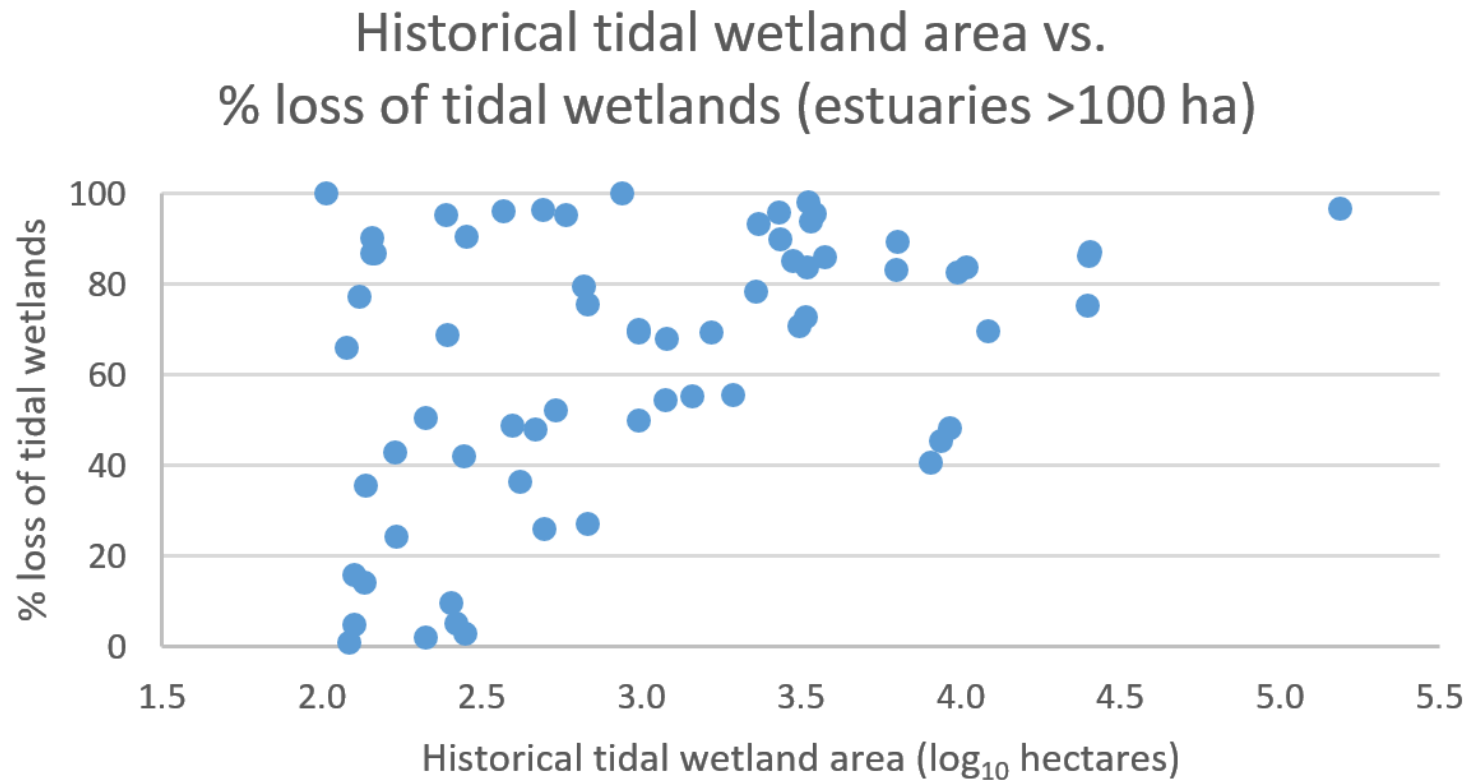
Loss assessment results

Estuary type	Number of estuaries		
	Included in TWL analysis	Not included	Total
Embayment/Bay	20	105	125
Major River Delta	9	8	17
Riverine Estuary	26	101	127
All types	55	214	269

- “Included in TWL analysis” are 55 non-lagoonal estuaries with historical tidal wetland area >100 ha and substantial human alterations.
- Lagoonal estuaries are omitted from the figures above.

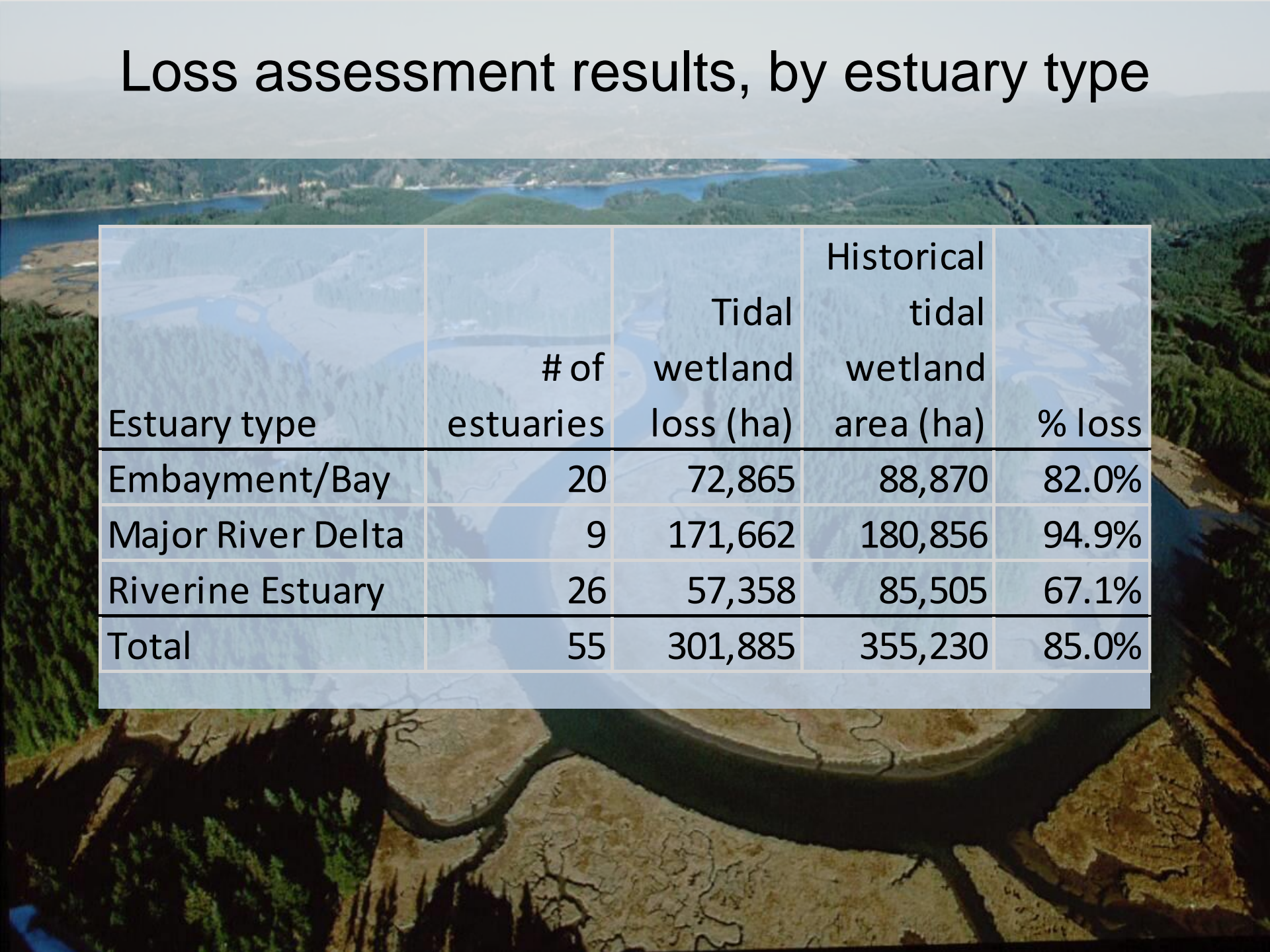
Loss assessment results

Percent loss is related to estuary size:



(Graph shows the 55 estuaries included in the TWL assessment.)

Loss assessment results, by estuary type



Estuary type	# of estuaries	Tidal wetland loss (ha)	Historical tidal wetland area (ha)	% loss
Embayment/Bay	20	72,865	88,870	82.0%
Major River Delta	9	171,662	180,856	94.9%
Riverine Estuary	26	57,358	85,505	67.1%
Total	55	301,885	355,230	85.0%

Loss assessment results, by ecoregion

Ecoregion	# of estuaries	Tidal wetland loss (ha)	Historical tidal wetland area (ha)	% loss
Central CA	9	213,882	233,271	91.7%
Salish Sea	13	25,931	30,448	85.2%
S. CA Bight	7	1,965	3,347	58.7%
WA, OR, N. CA	26	60,107	88,164	68.2%
Total	55	301,885	355,230	85.0%

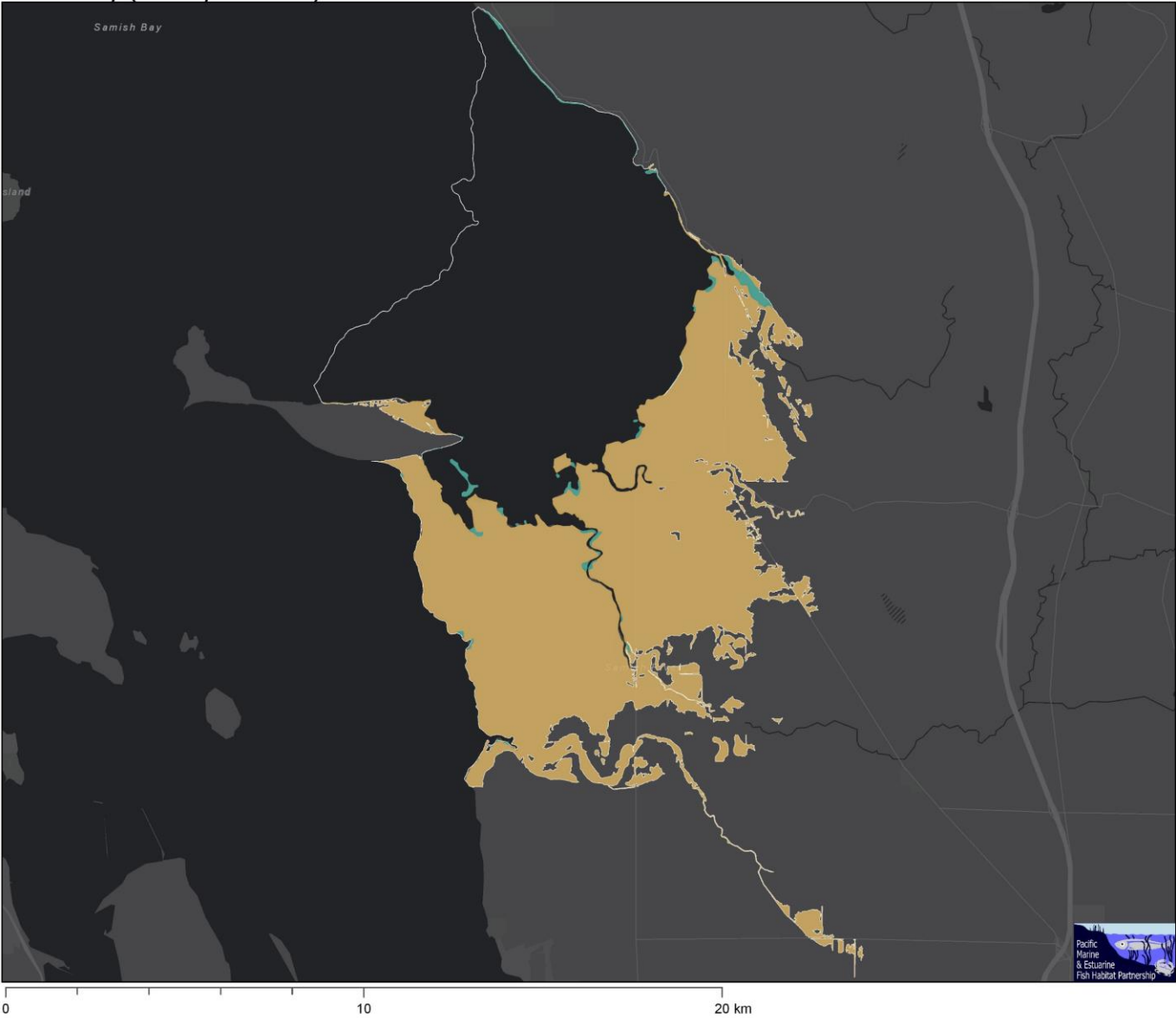
Top 20 West Coast estuaries (by historical wetland area)

Estuary	Tidal wetland loss	
	Area (ha)	%
Sacramento-San Joaquin Delta	149,068.8	96.8
Suisun-Grizzly Bays	22,277.2	87.2
South San Francisco Bay	21,701.4	86.2
San Pablo Bay	18,831.2	75.3
Columbia River - Reach F	8,497.9	69.7
Columbia River - Reach C	8,707.3	83.7
Skagit Bay	8,097.7	82.6
Columbia River - Reach B	4,470.2	48.3
Grays Harbor	3,958.0	45.4
Willapa Bay	3,259.5	40.5
Snohomish River	5,658.1	89.4
Columbia River - Reach A	5,228.0	83.1
Humboldt Bay	3,244.8	85.9
Coquille River	3,339.8	95.5
Columbia River - Reach E	3,202.1	93.8
Samish Bay	3,276.2	98.2
Columbia River - Reach G	2,774.6	83.6
Coos Bay	2,390.5	72.7
Stillaguamish River	2,212.8	70.8
Eel River	2,543.4	85.0

Total % loss across
these 20 estuaries:
86.3%

These 20 estuaries
represent >90% of
West Coast historical
tidal wetland area.

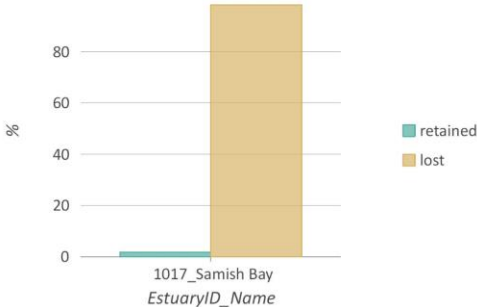
Samish Bay (Estuary ID: 1017)



PMEP Region: Salish Sea
CMECS Physiographic Setting: Major River Delta

Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost

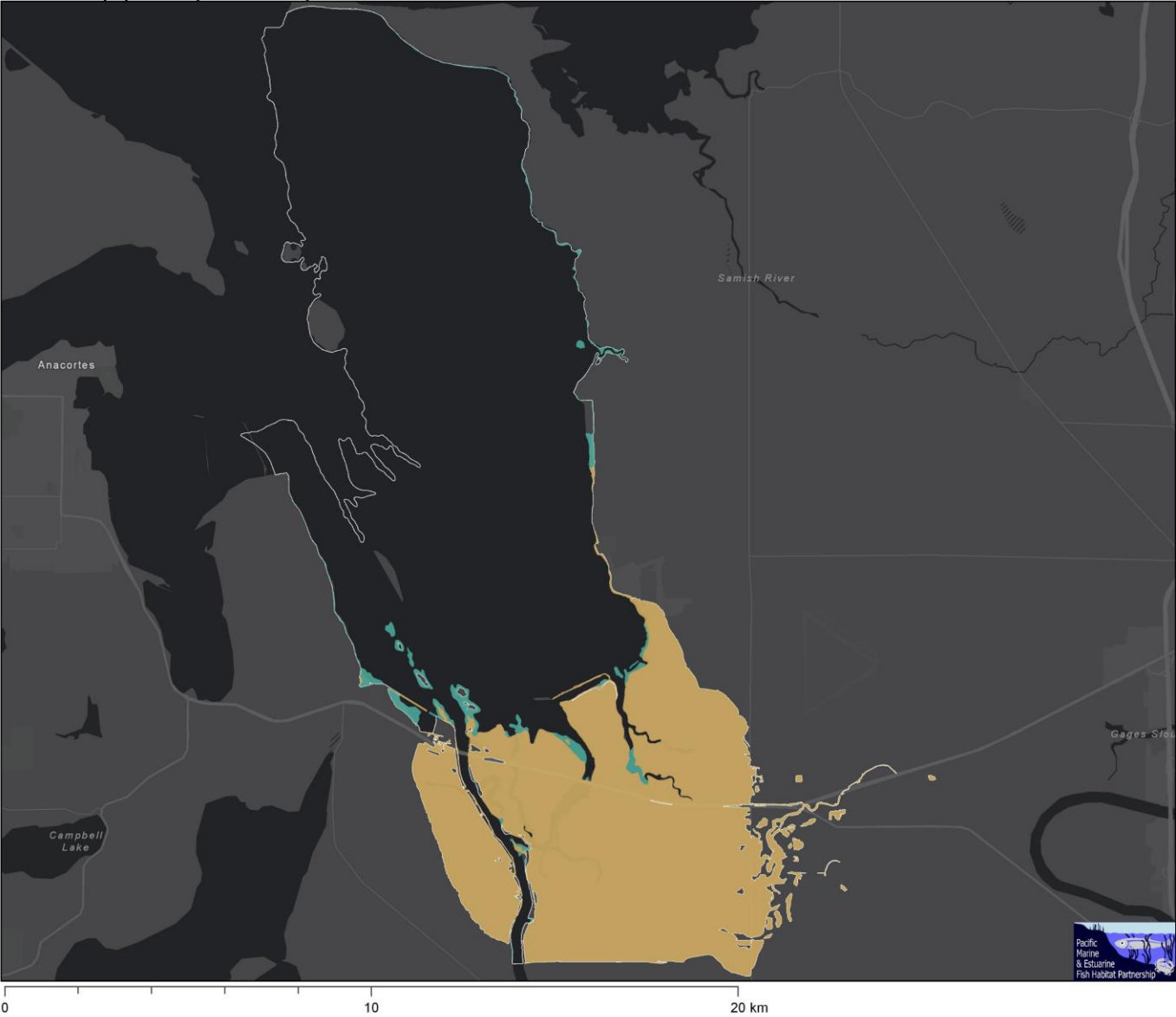


* includes emergent, scrub-shrub and forested veg. classes

Retained = 59.8 ha (1.8%)
Lost = 3,276.2 ha (98.2%)
Estuary Extent = 6,685.5 ha
Last NWI Update = 1981

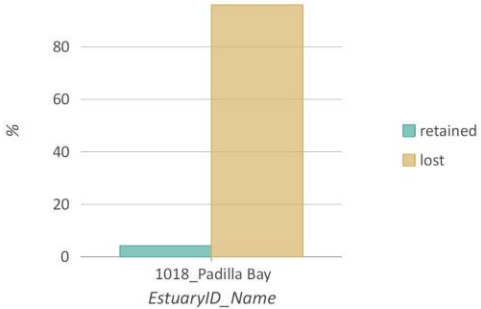


Padilla Bay (Estuary ID: 1018)



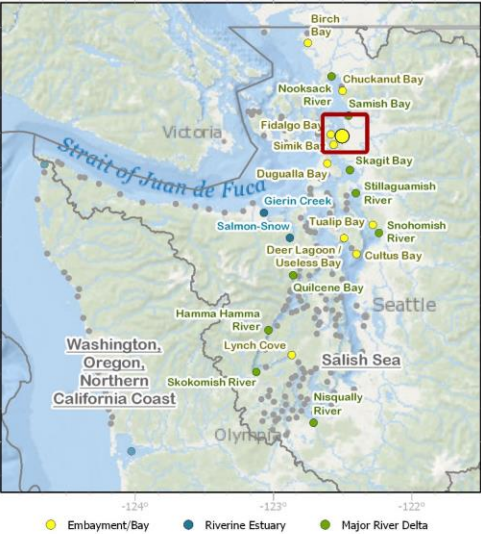
PMEP Region: Salish Sea
CMECS Physiographic Setting: Embayment/Bay
Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost

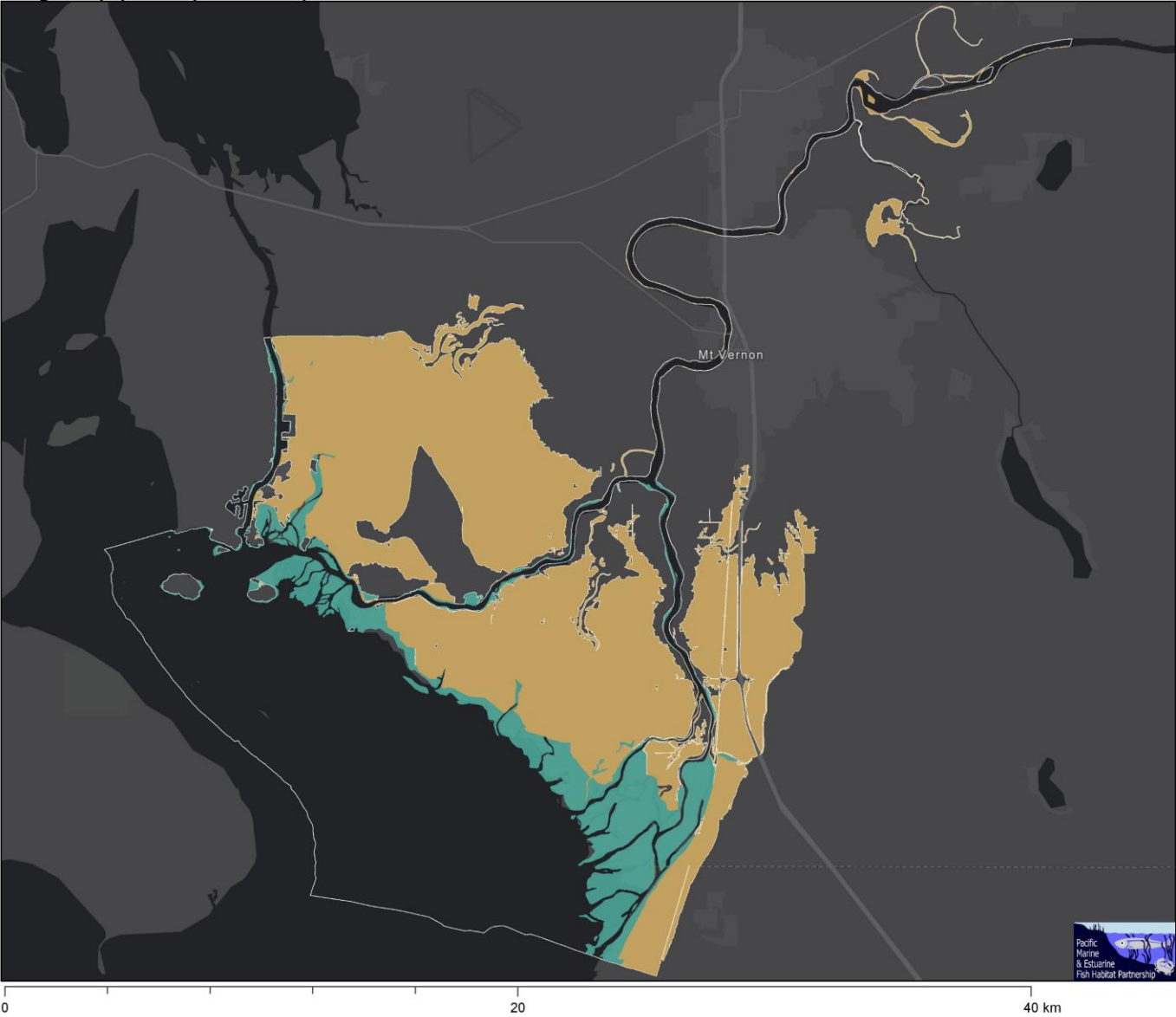


* includes emergent, scrub-shrub and forested veg. classes

Retained = 111.7 ha (4.1%)
Lost = 2,579.4 ha (95.9%)
Estuary Extent = 8,553.9 ha
Last NWI Update = 1981



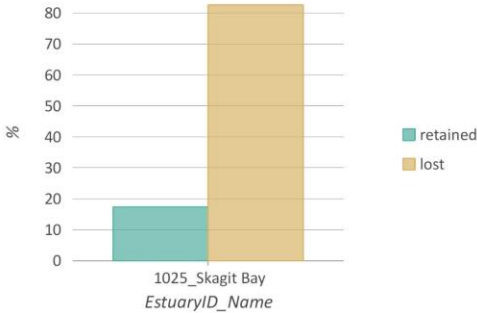
Skagit Bay (Estuary ID: 1025)



PMEP Region: Salish Sea
CMECS Physiographic Setting: Major River Delta

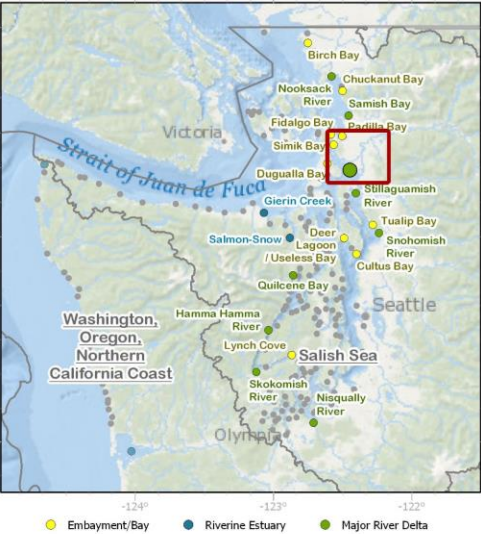
Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost

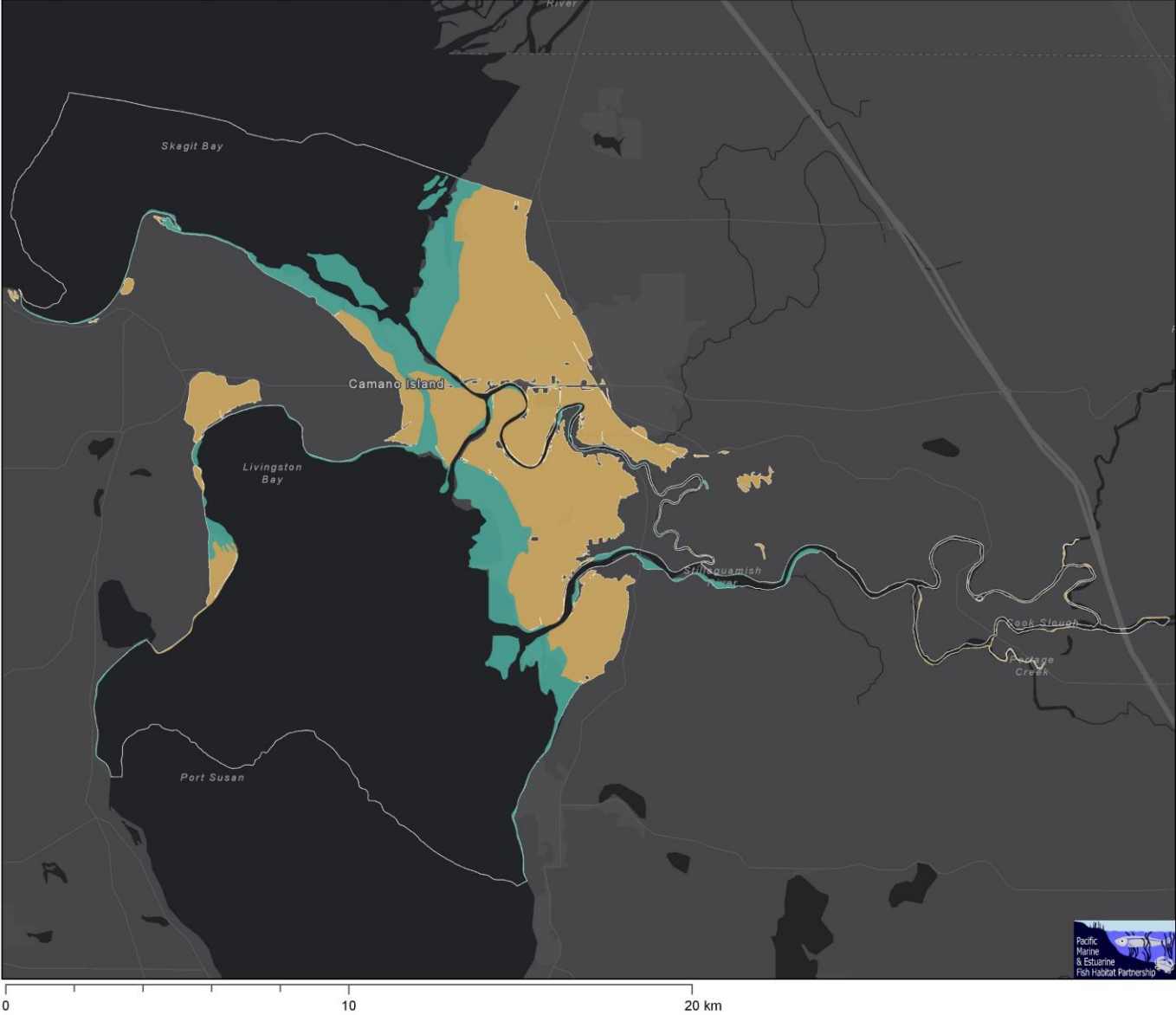


* includes emergent, scrub-shrub and forested veg. classes

Retained = 1,705.3 ha (17.4%)
Lost = 8,097.7 ha (82.6%)
Estuary Extent = 17,144.7 ha
Last NWI Update = 1981



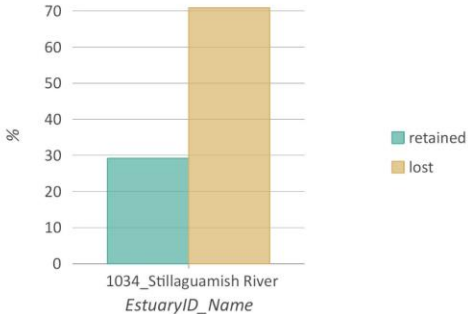
Stillaguamish River (Estuary ID: 1034)



PMEP Region: Salish Sea
CMECS Physiographic Setting: Major River Delta

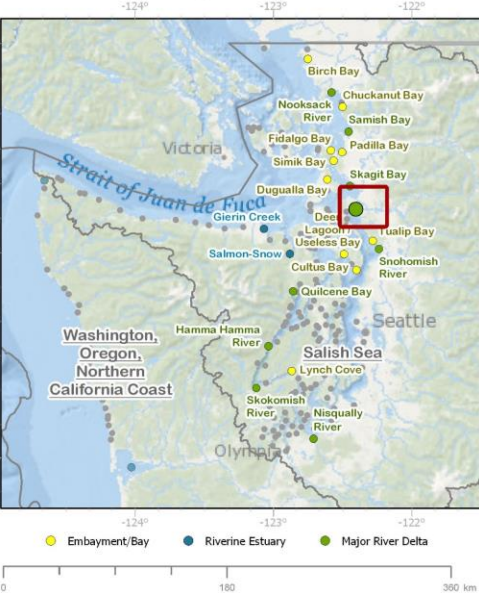
Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost

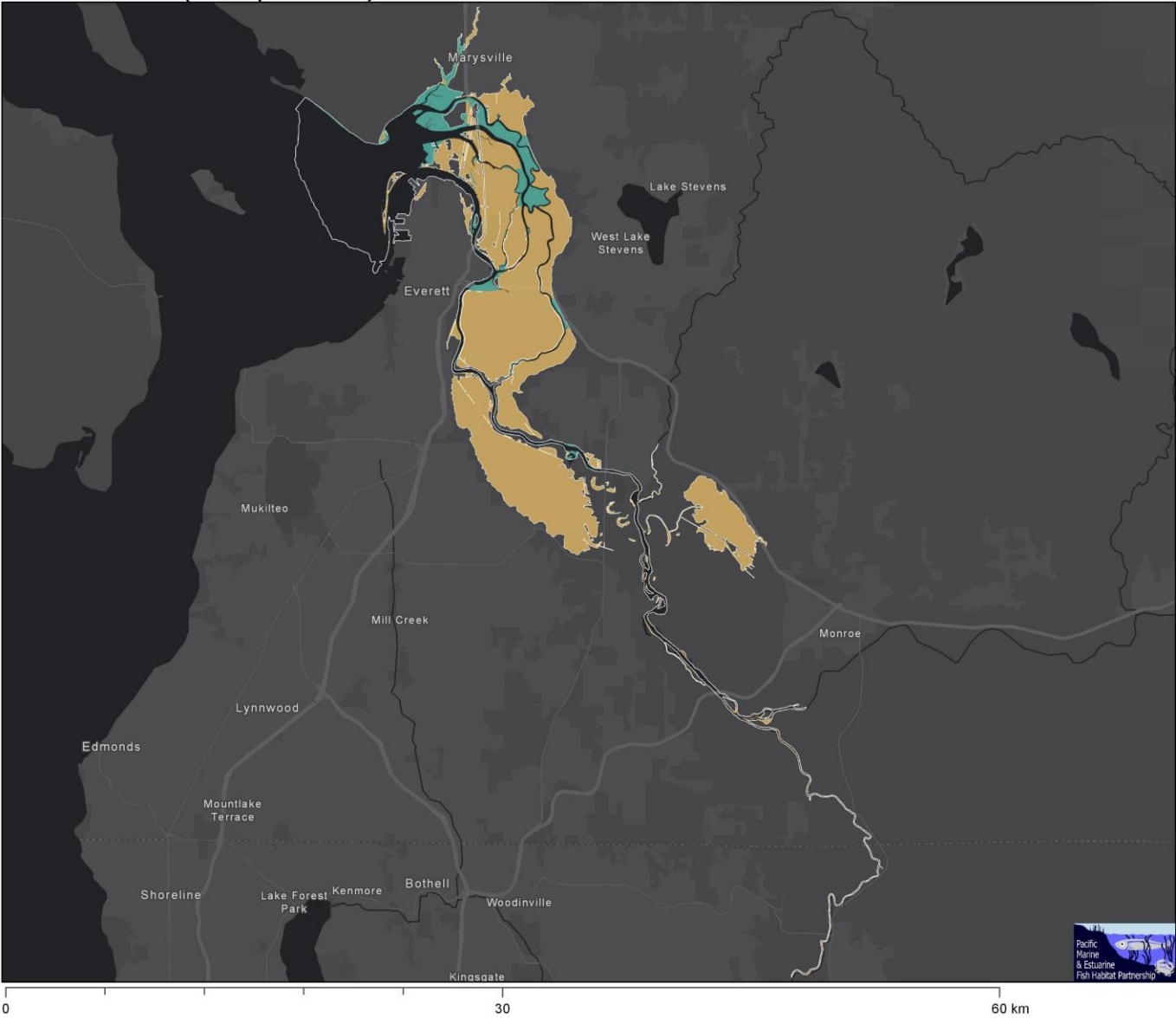


* includes emergent, scrub-shrub and forested veg. classes

Retained = 911.2 ha (29.2%)
Lost = 2,212.8 ha (70.8%)
Estuary Extent = 9,954.3 ha
Last NWI Update = 1981



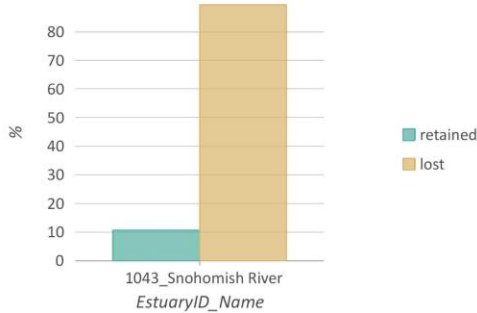
Snohomish River (Estuary ID: 1043)



PMEP Region: Salish Sea
CMECS Physiographic Setting: Major River Delta

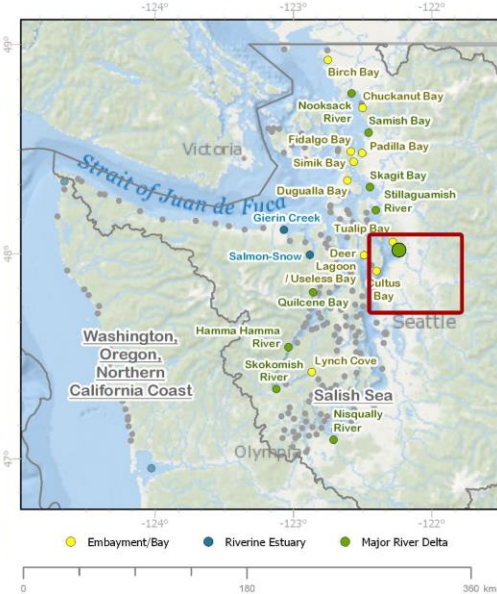
Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost

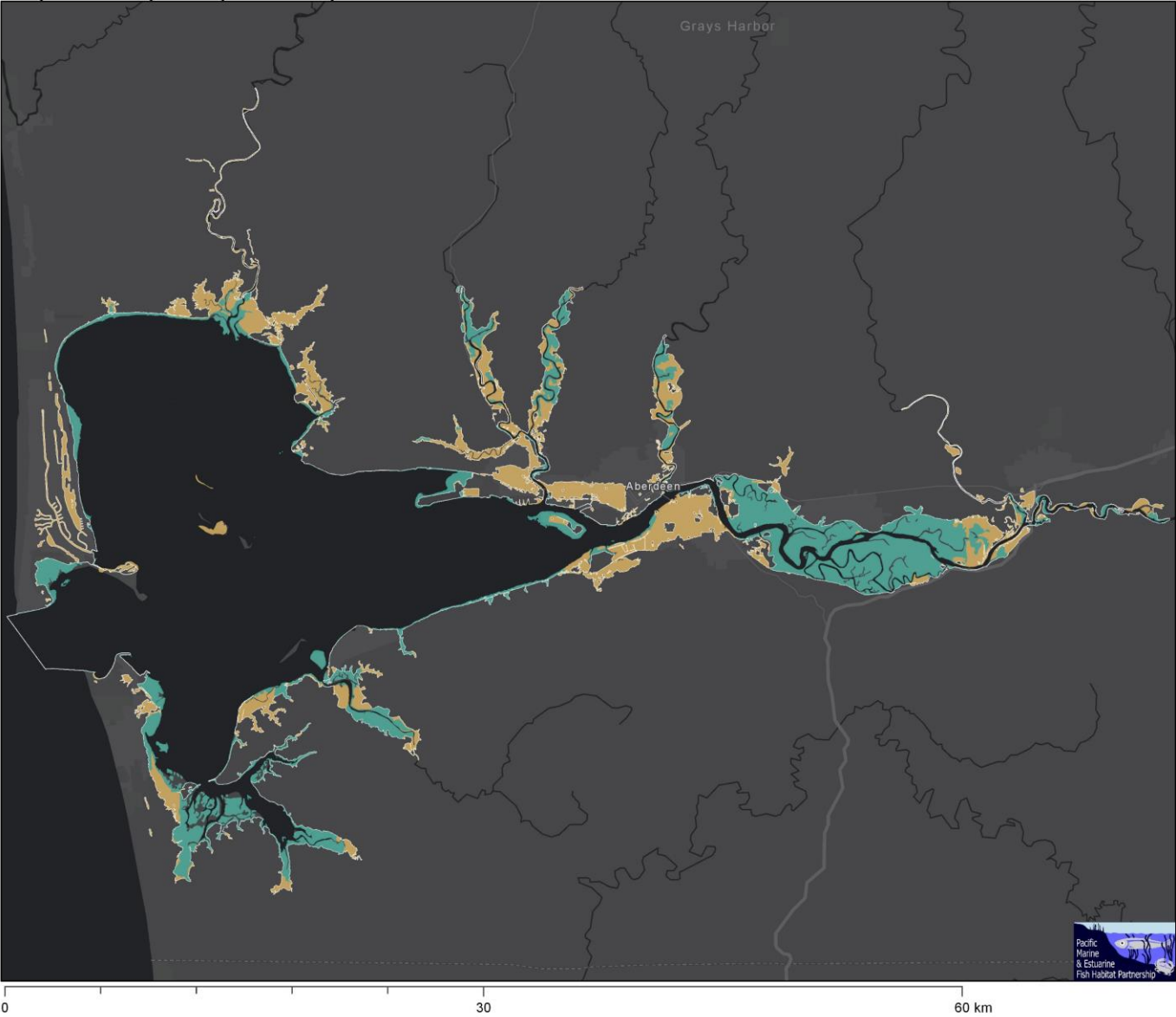


* includes emergent, scrub-shrub and forested veg. classes

Retained = 672.9 ha (10.6%)
Lost = 5,658.1 ha (89.4%)
Estuary Extent = 9,438.1 ha
Last NWI Update = 1981



Grays Harbor (Estuary ID: 2022)



PMEP Region: Washington, Oregon, Northern California Coast
CMECS Physiographic Setting: Riverine Estuary

Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost

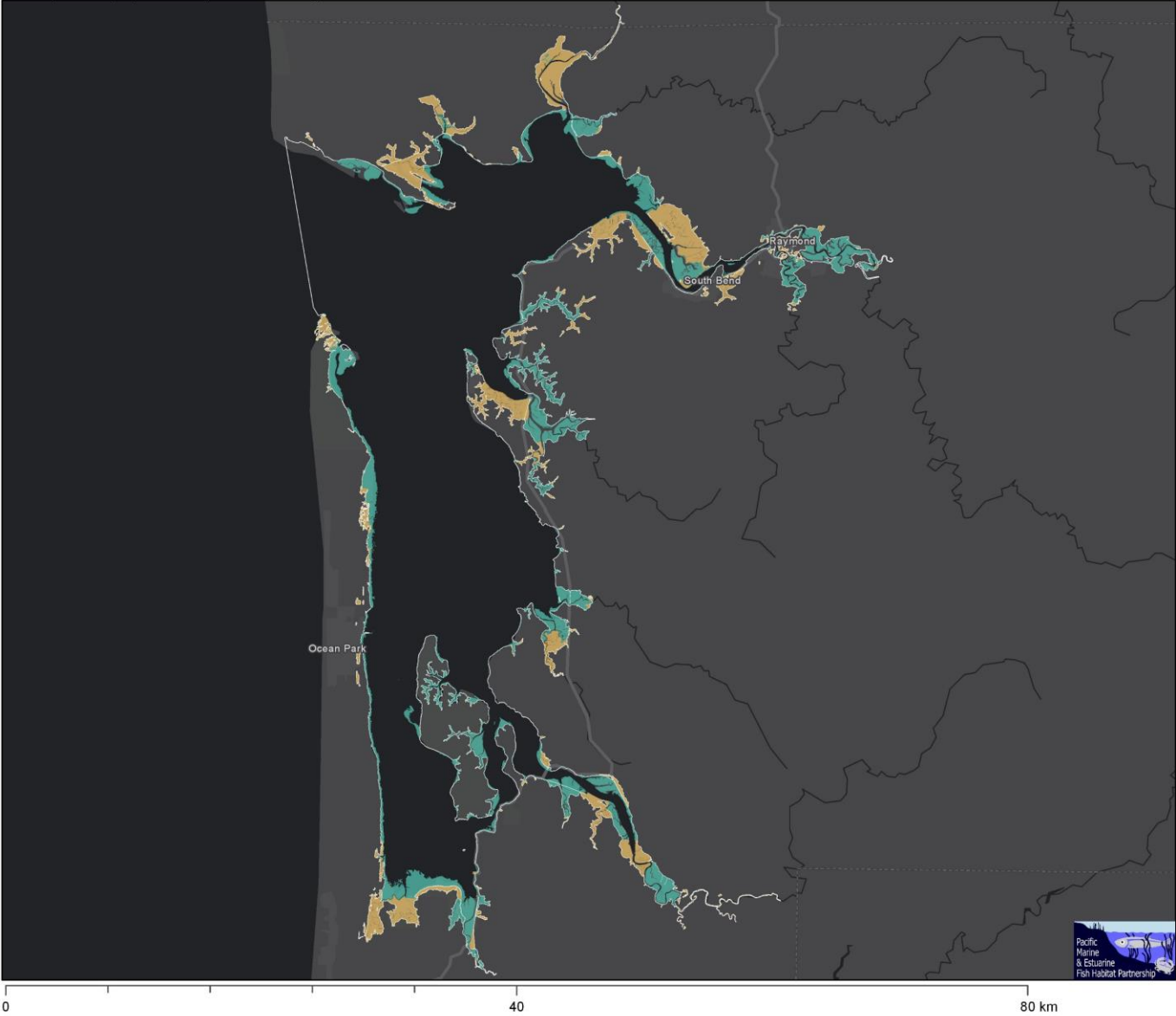


* includes emergent, scrub-shrub and forested veg. classes

Retained = 4,753.8 ha (54.6%)
Lost = 3,958 ha (45.4%)
Estuary Extent = 33,583.2 ha
Last NWI Update = 1981



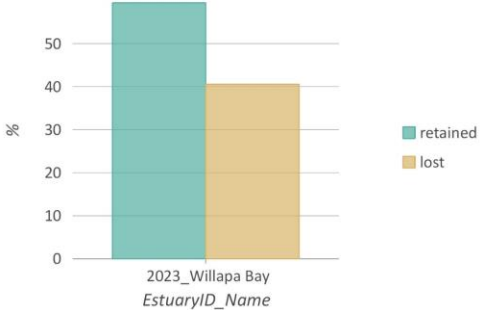
Willapa Bay (Estuary ID: 2023)



PMEP Region: Washington, Oregon, Northern California Coast
CMECS Physiographic Setting: Riverine Estuary

Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost

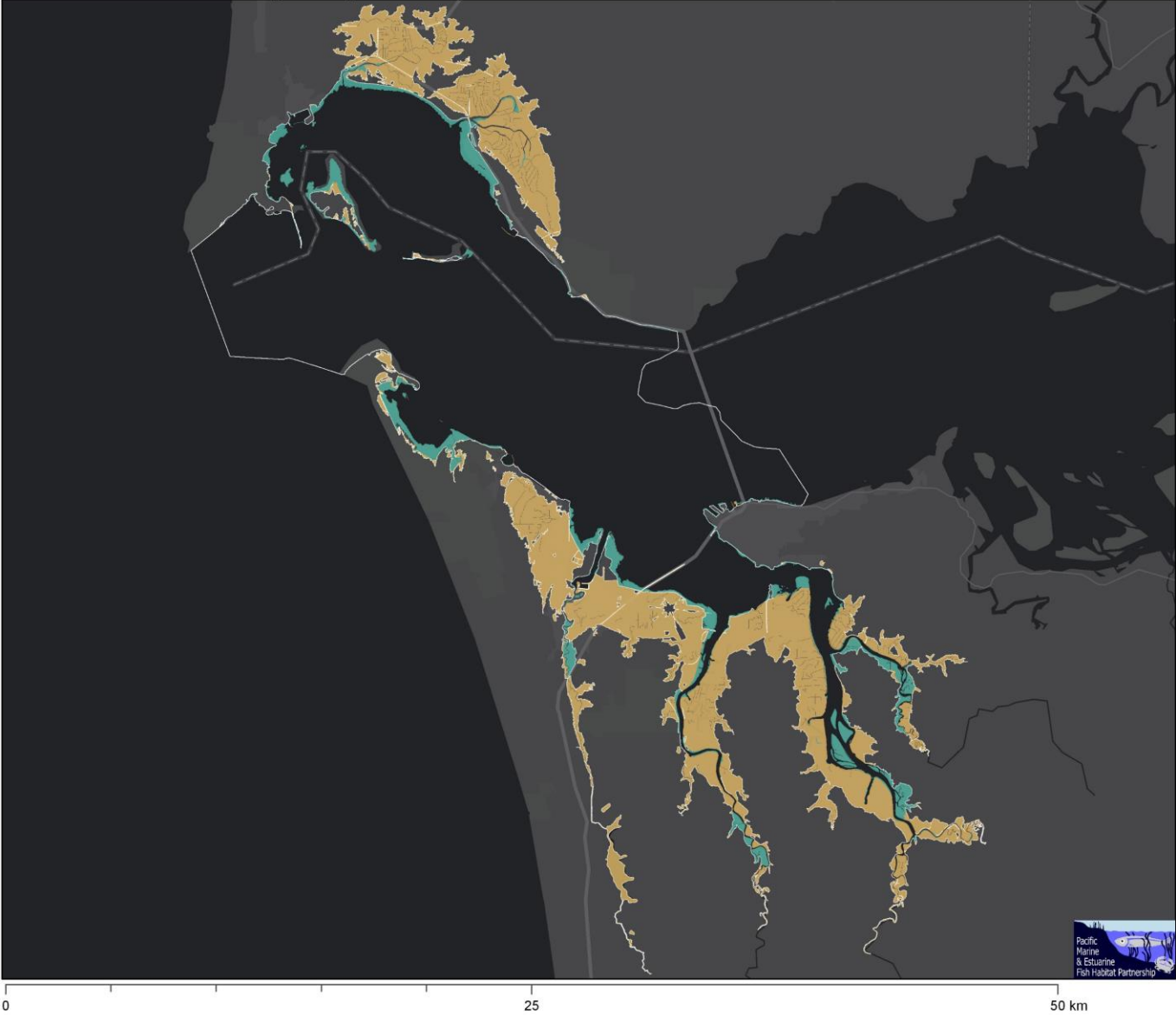


* includes emergent, scrub-shrub and forested veg. classes

Retained = 4,780.6 ha (59.5%)
Lost = 3,259.5 ha (40.5%)
Estuary Extent = 43,264.3 ha
Last NWI Update = 2011



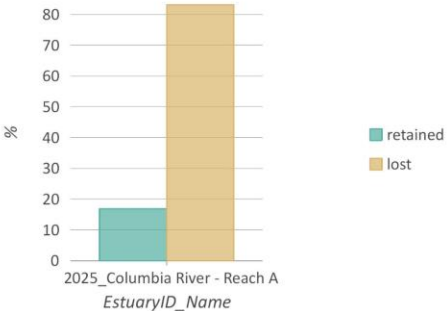
Columbia River - Reach A (Estuary ID: 2025)



PMEP Region: Washington, Oregon, Northern California Coast
CMECS Physiographic Setting: Riverine Estuary

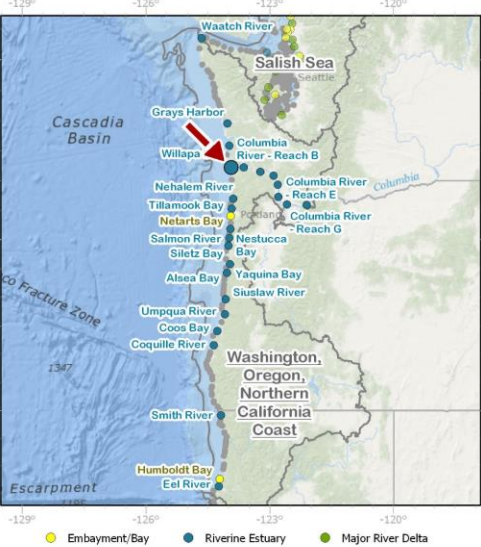
Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost

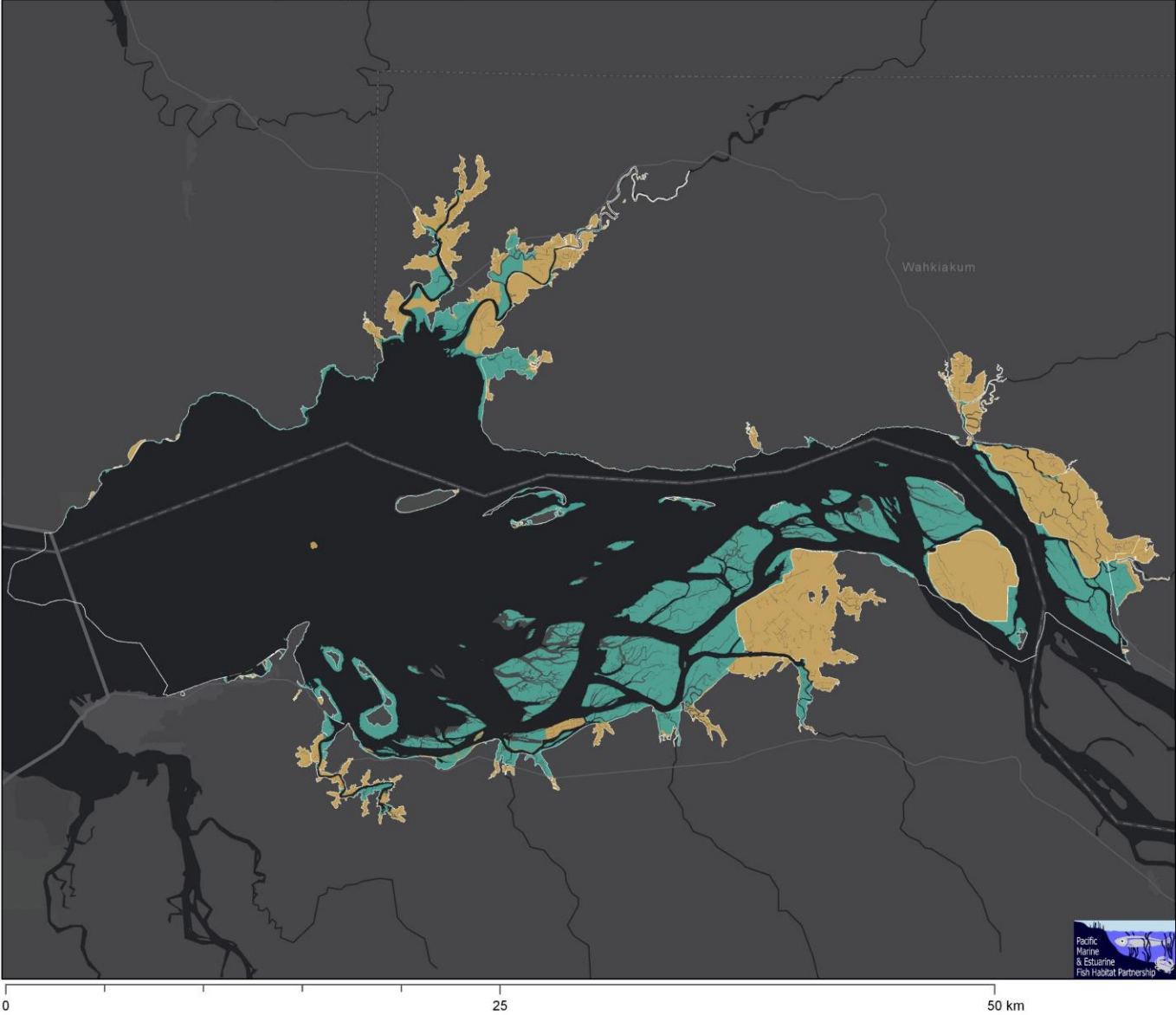


* includes emergent, scrub-shrub and forested veg. classes

Retained = 1,063 ha (16.9%)
Lost = 5,228 ha (83.1%)
Estuary Extent = 20,903.9 ha
Last NWI Update = 2011



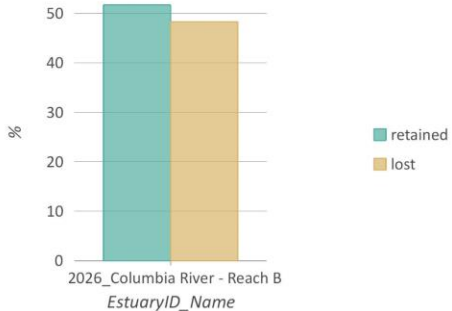
Columbia River - Reach B (Estuary ID: 2026)



PMEP Region: Washington, Oregon, Northern California Coast
CMECS Physiographic Setting: Riverine Estuary

Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost

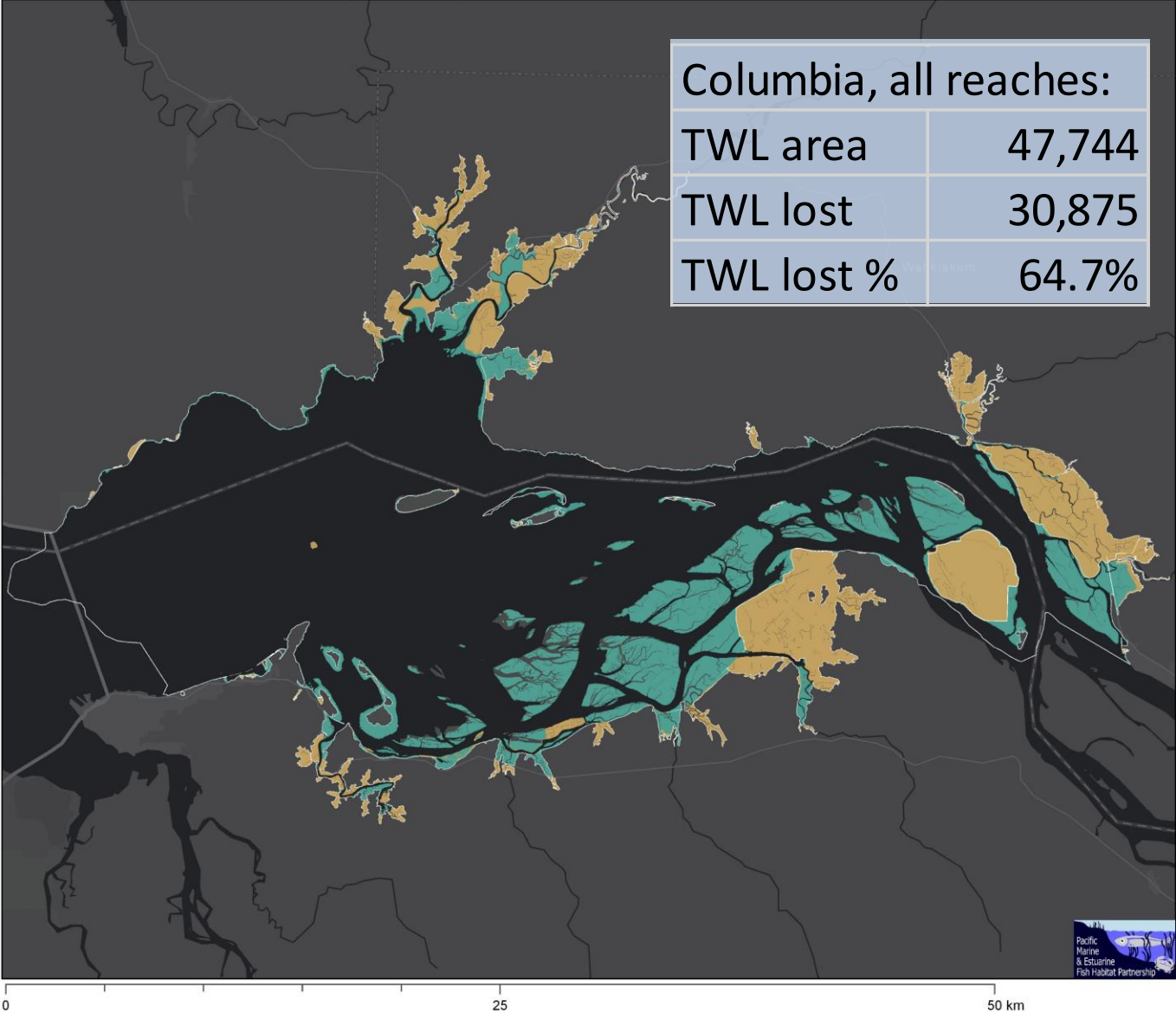


* includes emergent, scrub-shrub and forested veg. classes

Retained = 4,782.1 ha (51.7%)
Lost = 4,470.2 ha (48.3%)
Estuary Extent = 34,094.7 ha
Last NWI Update = 1981



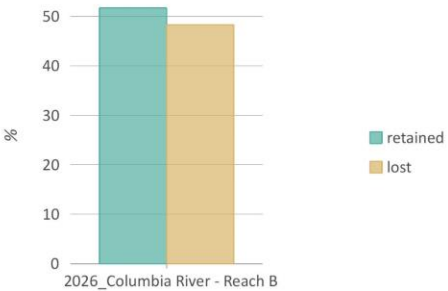
Columbia River - Reach B (Estuary ID: 2026)



PMEP Region: Washington, Oregon, Northern California Coast
CMECS Physiographic Setting: Riverine Estuary

Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost

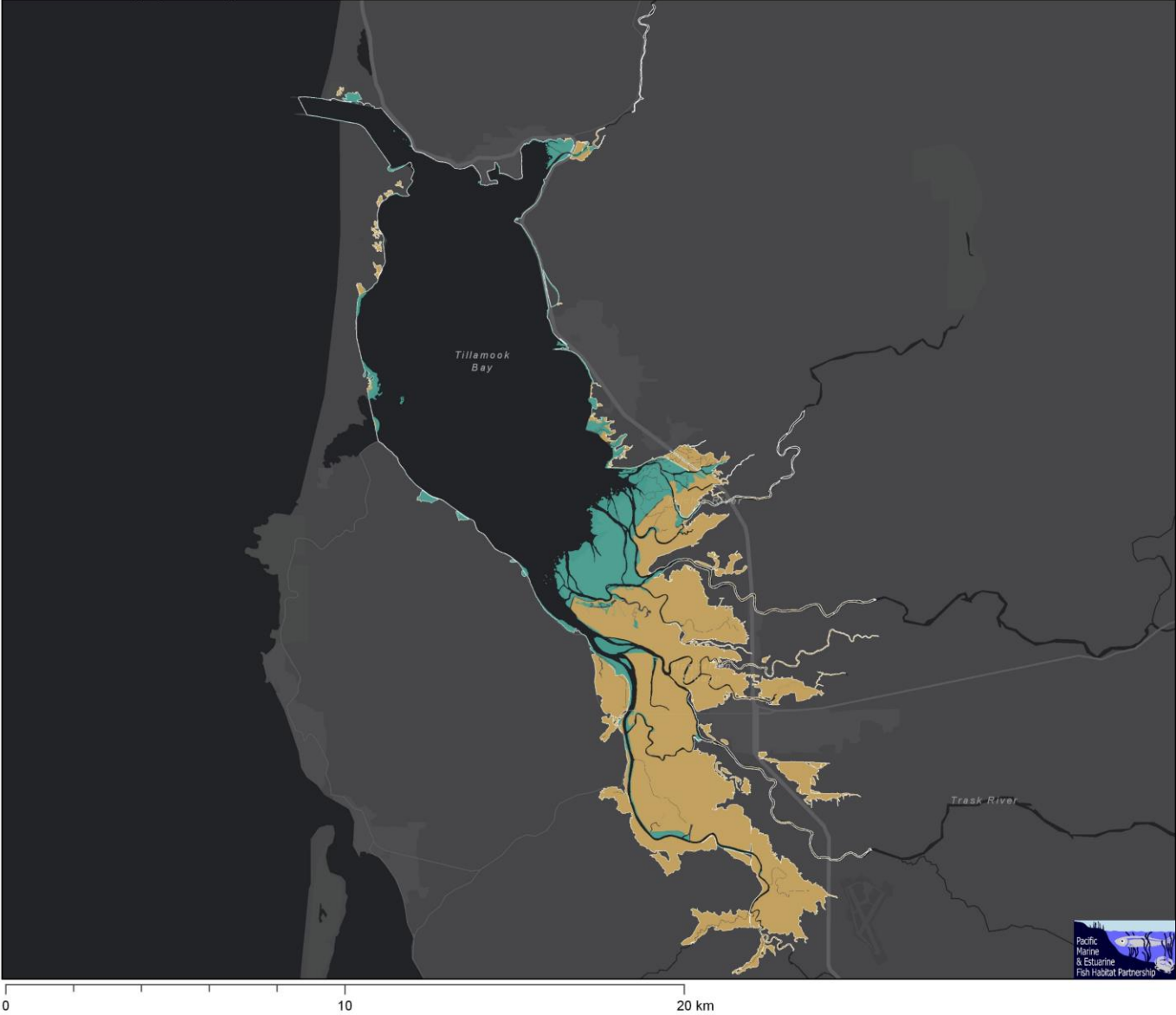


* includes emergent, scrub-shrub and forested veg. classes

Retained = 4,782.1 ha (51.7%)
Lost = 4,470.2 ha (48.3%)
Estuary Extent = 34,094.7 ha
Last NWI Update = 1981



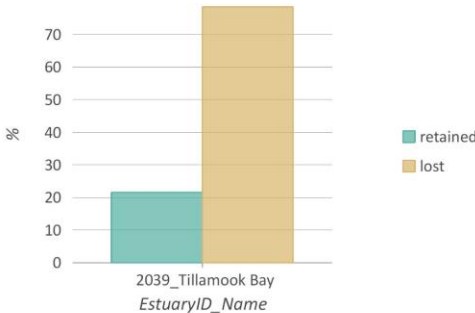
Tillamook Bay (Estuary ID: 2039)



PMEP Region: Washington, Oregon, Northern California Coast
CMECS Physiographic Setting: Riverine Estuary

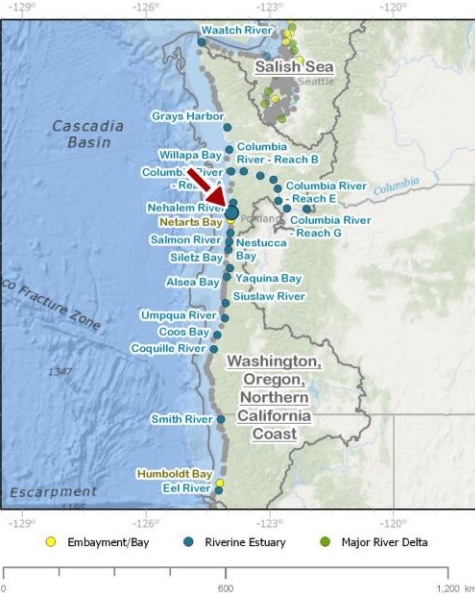
Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost

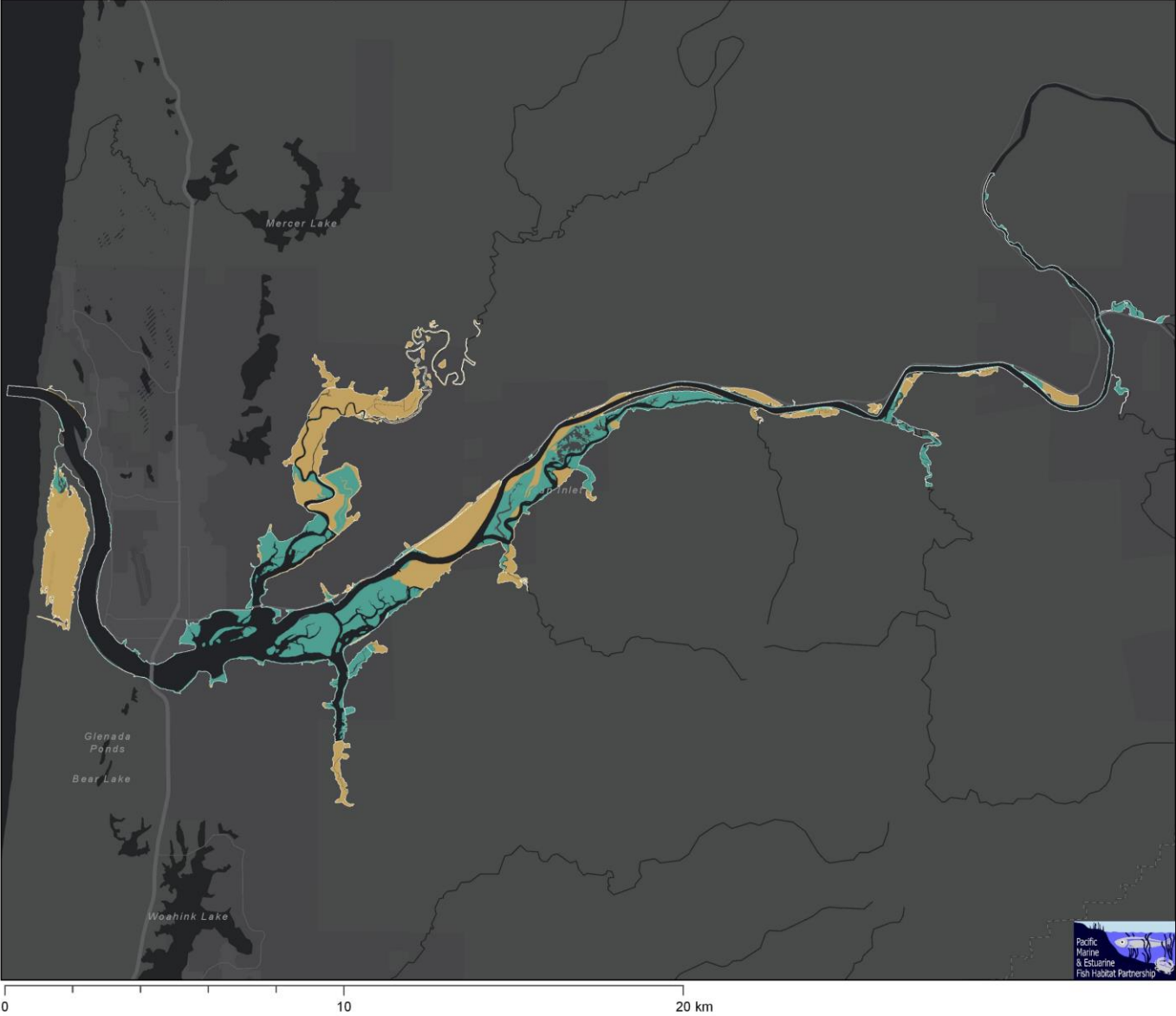


* includes emergent, scrub-shrub and forested veg. classes

Retained = 494.2 ha (21.6%)
Lost = 1,797.9 ha (78.4%)
Estuary Extent = 5,677.1 ha
Last NWI Update = 2000



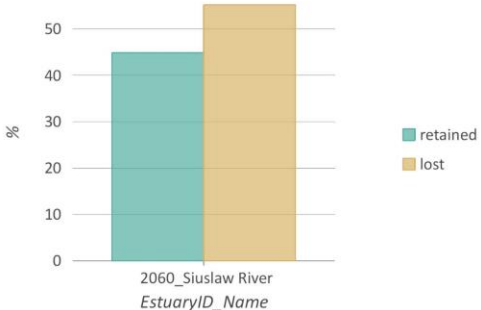
Siuslaw River (Estuary ID: 2060)



PMEP Region: Washington, Oregon, Northern California Coast
CMECS Physiographic Setting: Riverine Estuary

Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost

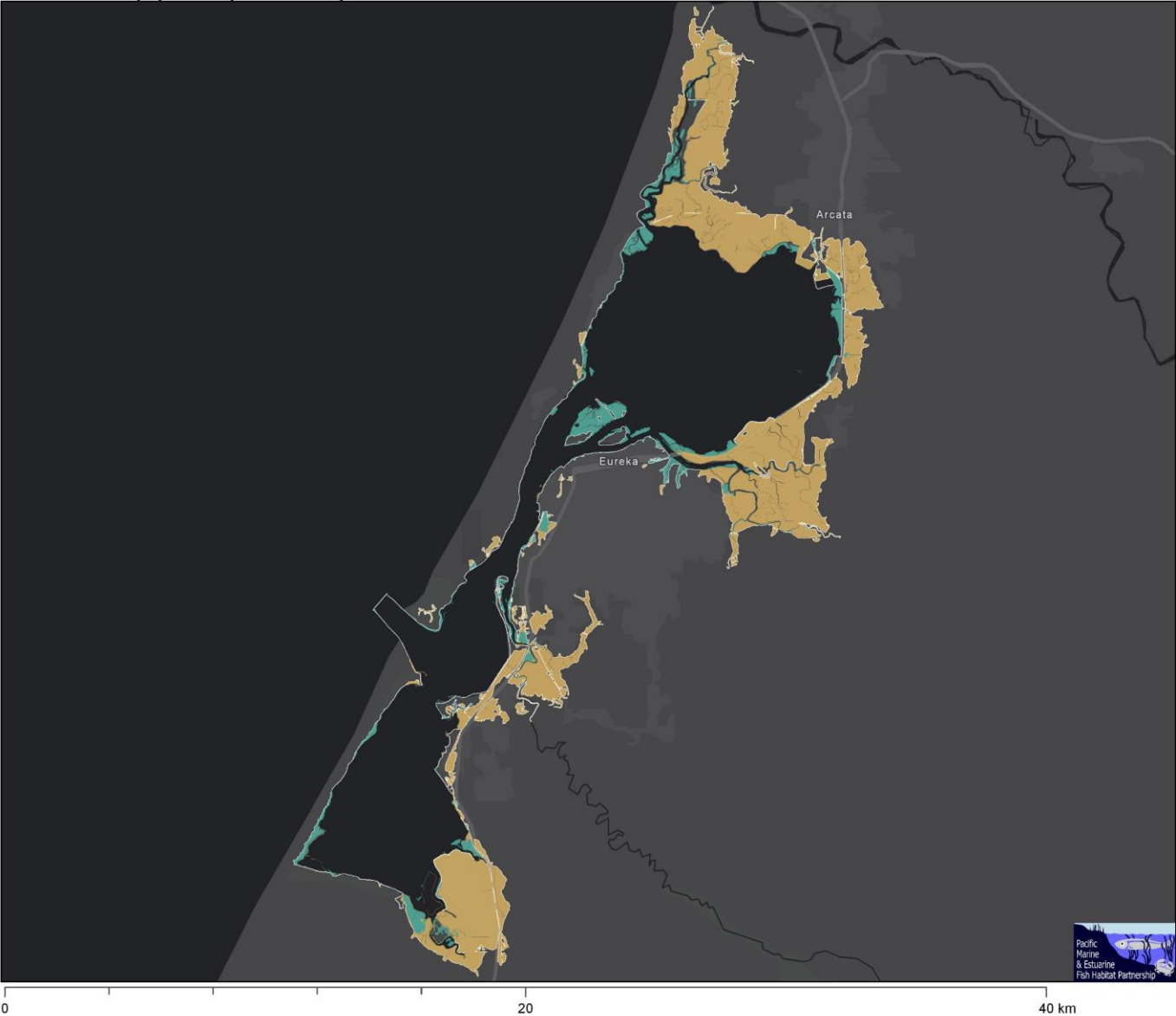


* includes emergent, scrub-shrub and forested veg. classes

Retained = 648 ha (44.8%)
Lost = 797 ha (55.2%)
Estuary Extent = 2,557.7 ha
Last NWI Update = 2000



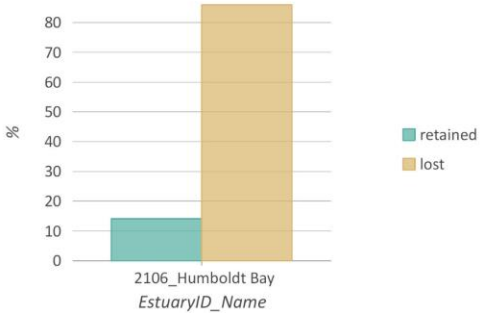
Humboldt Bay (Estuary ID: 2106)



PMEP Region: Washington, Oregon, Northern California Coast
CMECS Physiographic Setting: Embayment/Bay

Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost

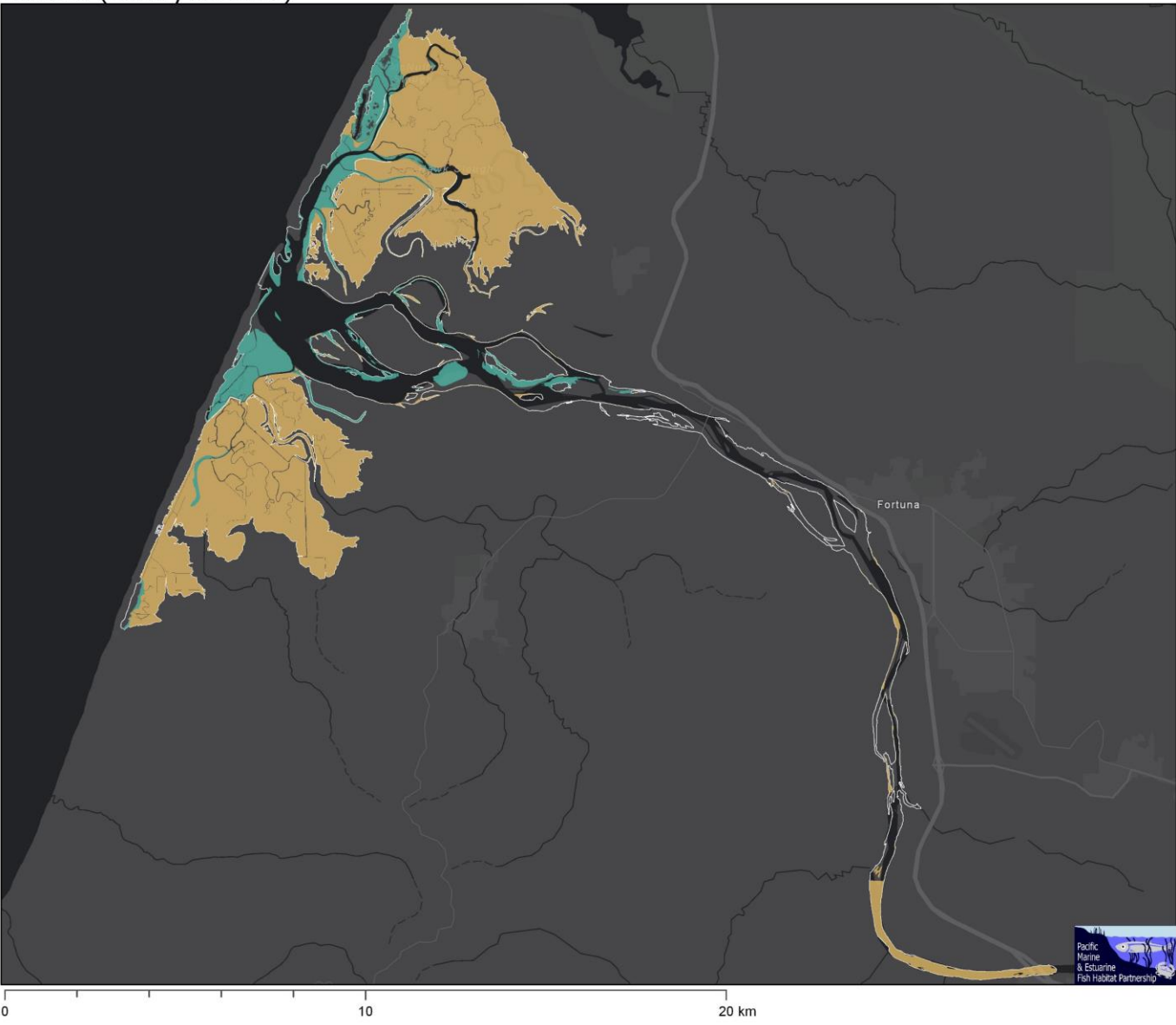


* includes emergent, scrub-shrub and forested veg. classes

Retained = 532.3 ha (14.1%)
Lost = 3,244.8 ha (85.9%)
Estuary Extent = 10,683.3 ha
Last NWI Update = 2010



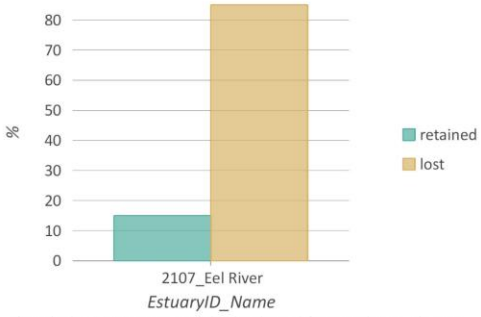
Eel River (Estuary ID: 2107)



PMEP Region: Washington, Oregon, Northern California Coast
CMECS Physiographic Setting: Riverine Estuary

Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost



* includes emergent, scrub-shrub and forested veg. classes

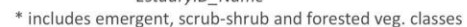
Retained = 447.8 ha (15%)
Lost = 2,543.4 ha (85%)
Estuary Extent = 4,275.5 ha
Last NWI Update = 2010



The map displays the distribution of the Pacific herring population in the San Francisco Bay Area. The distribution area is highlighted in yellow, covering the bay and surrounding waters. Major cities and locations are labeled, including San Francisco, Berkeley, Oakland, San Jose, and San Diego. The map also shows the distribution of the Pacific herring population in the Pacific Ocean, with a scale bar indicating distances up to 160 km.

CMECS Physiographic Setting: Major River Delta

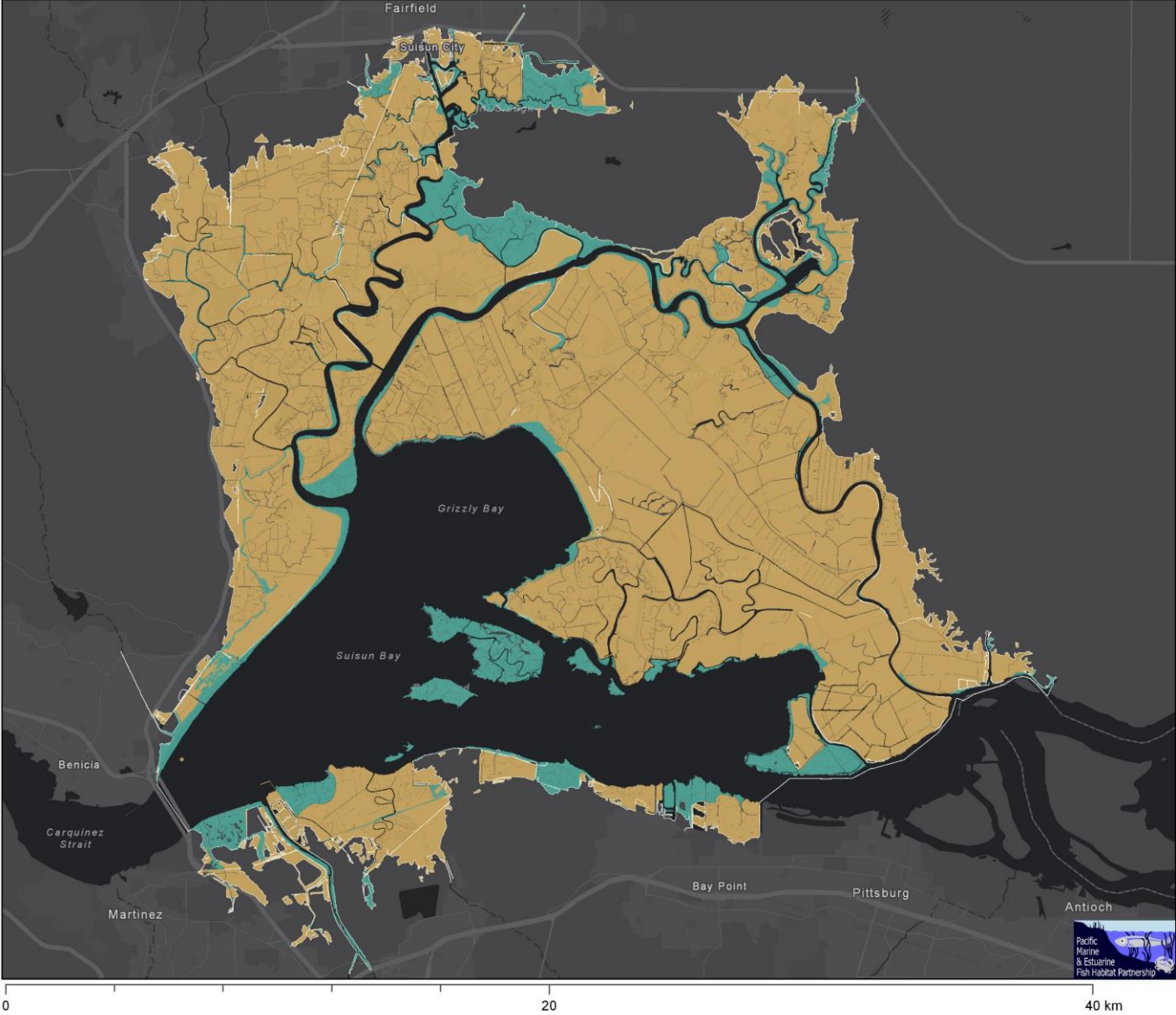
Vegetated Tidal Wetlands* - Retained vs. Lost



Lost = 149,068.8 ha (96.8%)

Last NWI Update = 2012

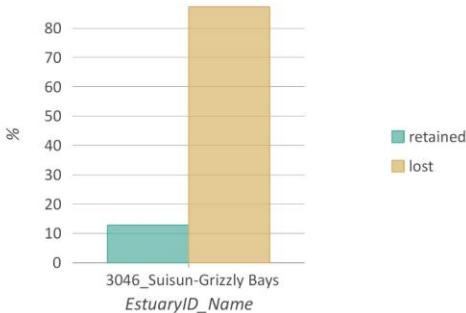
Suisun-Grizzly Bays (Estuary ID: 3046)



PMEP Region: Central California
CMECS Physiographic Setting: Embayment/Bay

Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost

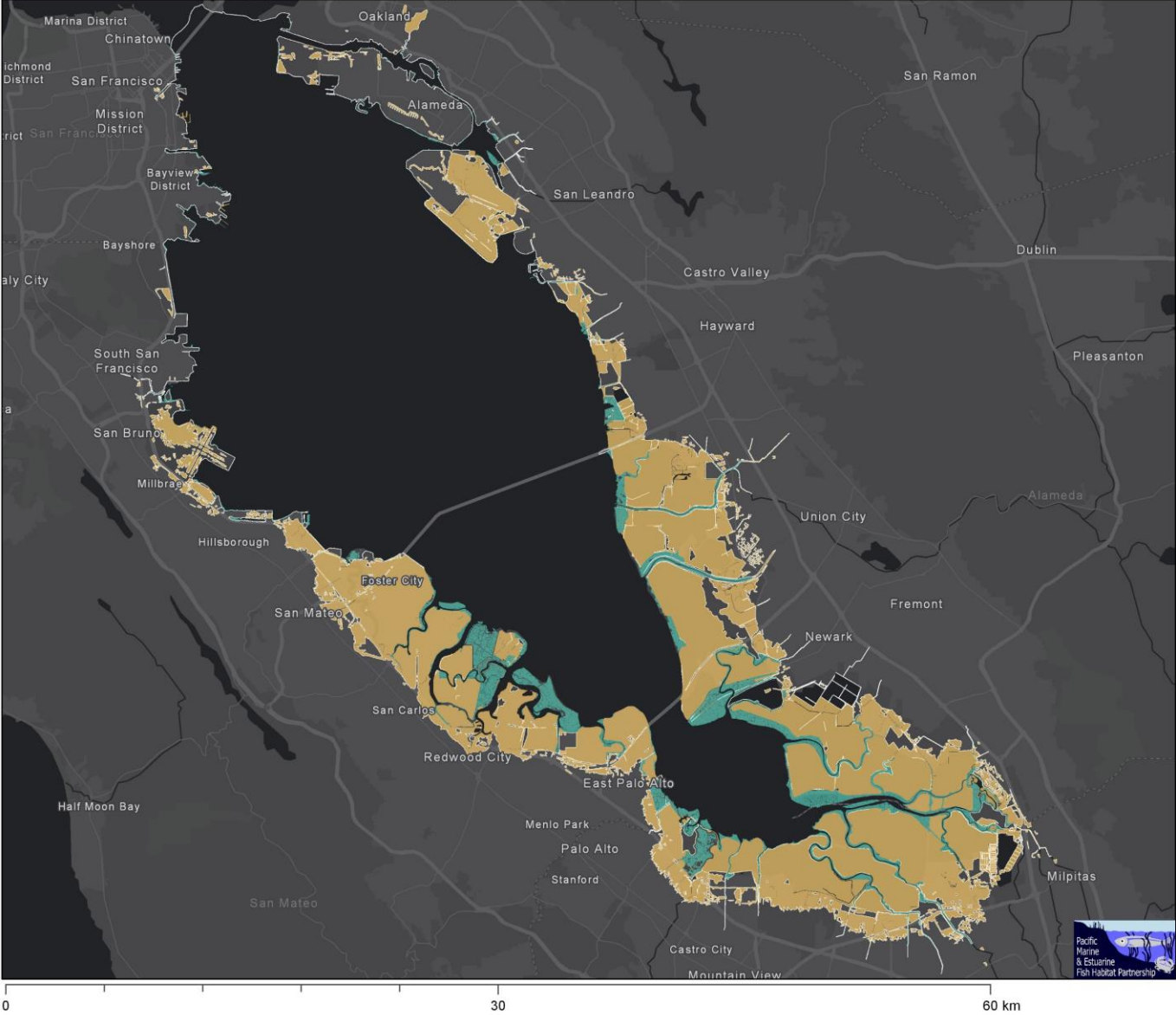


* includes emergent, scrub-shrub and forested veg. classes

Retained = 3,262.5 ha (12.8%)
Lost = 22,277.2 ha (87.2%)
Estuary Extent = 37,832.8 ha
Last NWI Update = 2009



South San Francisco Bay (Estuary ID: 3049)



PMEP Region: Central California
CMECS Physiographic Setting: Embayment/Bay

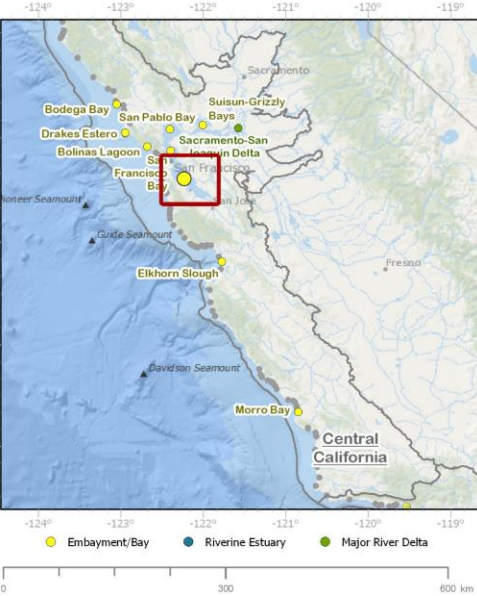
Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost

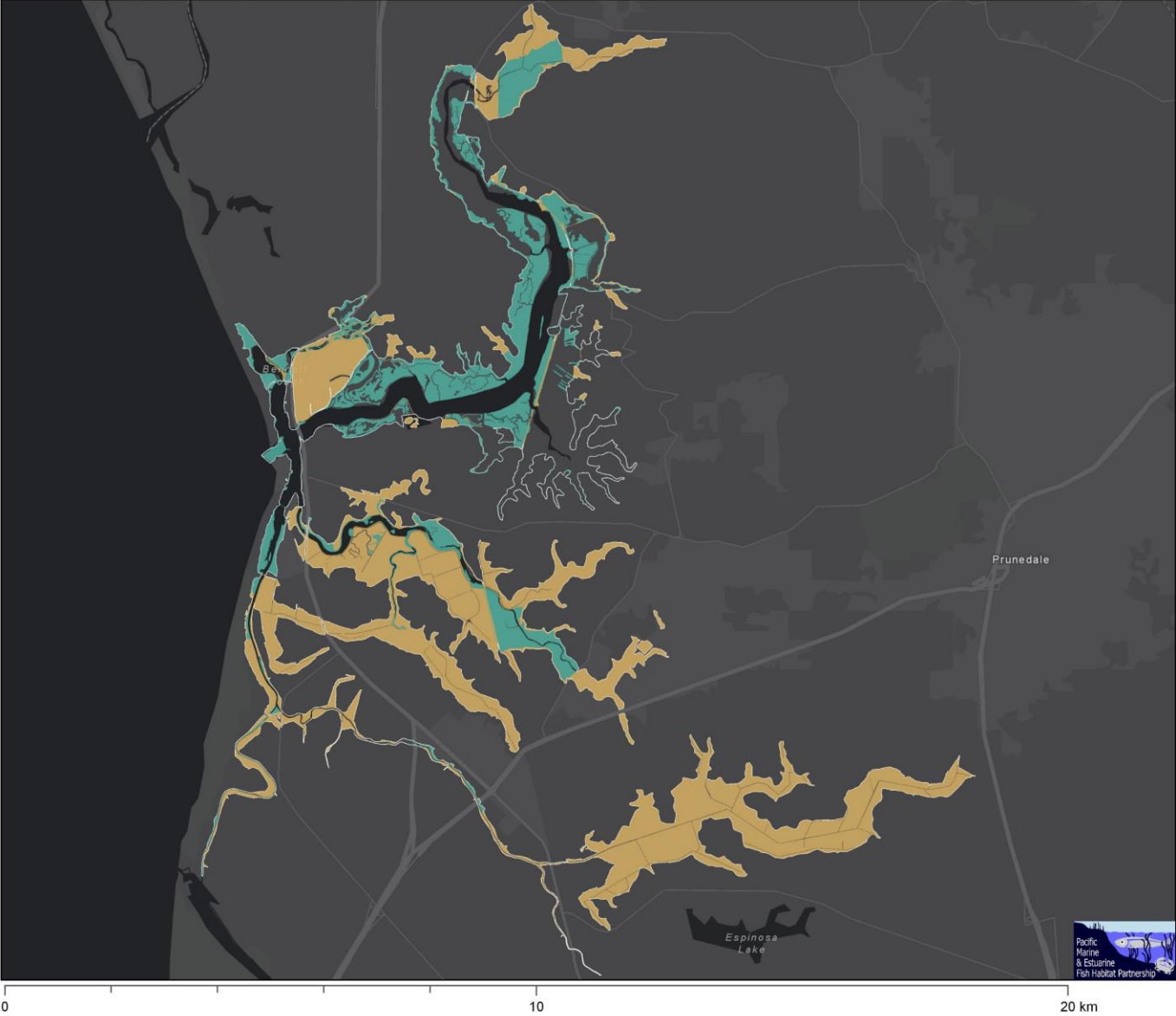


* includes emergent, scrub-shrub and forested veg. classes

Retained = 3,480.9 ha (13.8%)
Lost = 21,701.4 ha (86.2%)
Estuary Extent = 74,972.1 ha
Last NWI Update = 2009



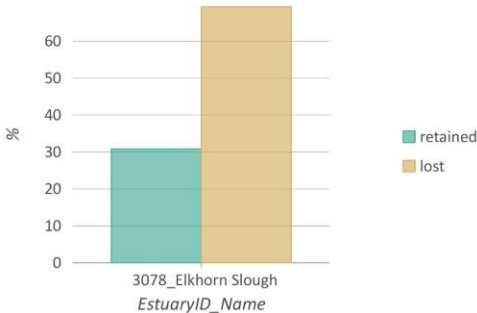
Elkhorn Slough (Estuary ID: 3078)



PMEP Region: Central California
CMECS Physiographic Setting: Embayment/Bay

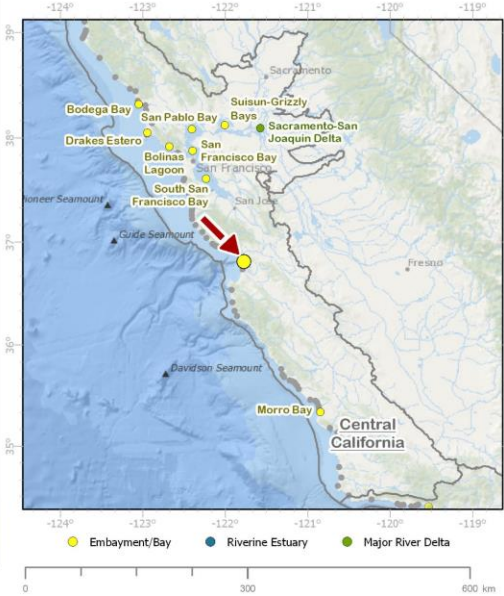
Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost

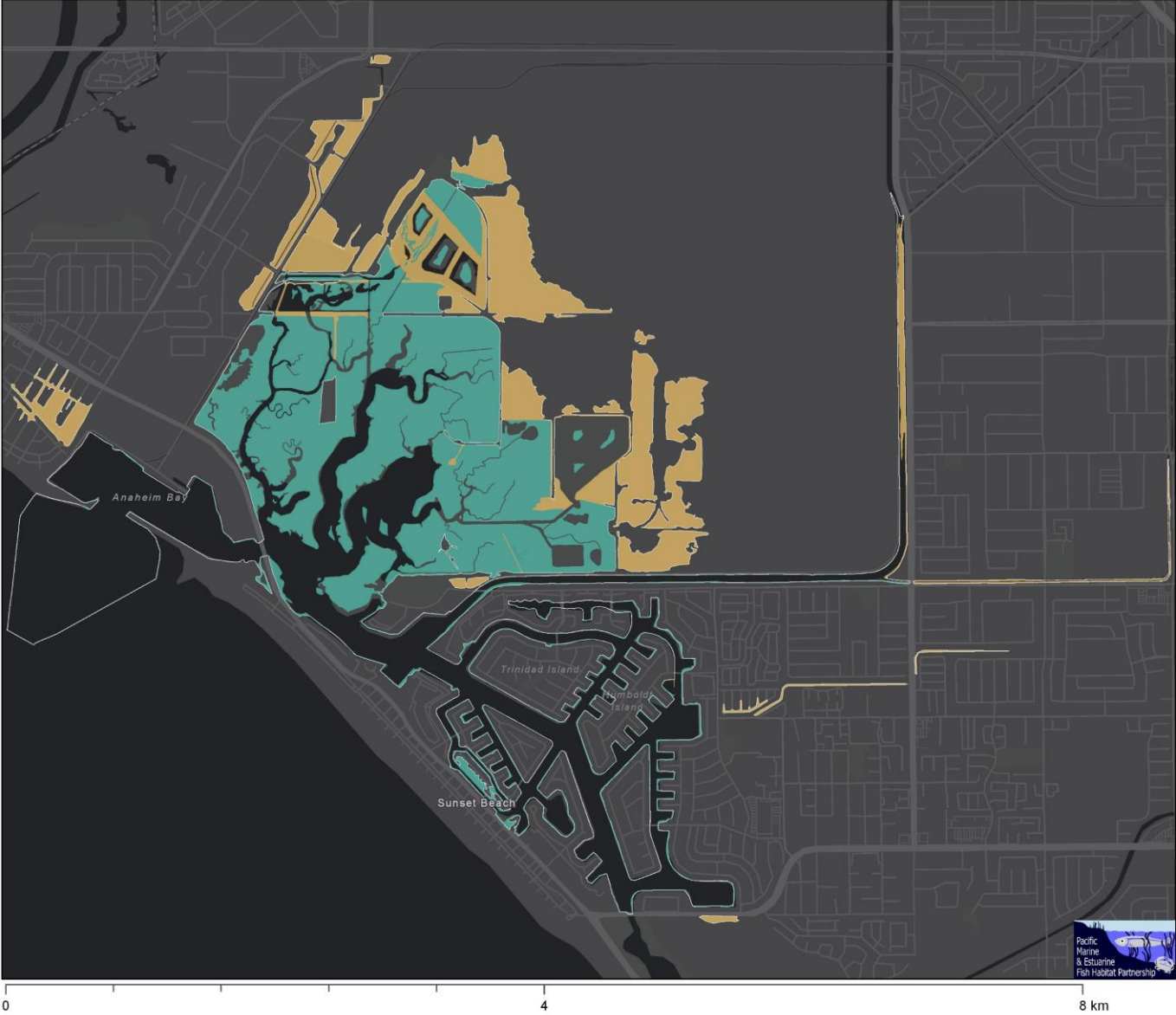


* includes emergent, scrub-shrub and forested veg. classes

Retained = 511.7 ha (30.8%)
Lost = 1,150.9 ha (69.2%)
Estuary Extent = 2,398 ha
Last NWI Update = 2005



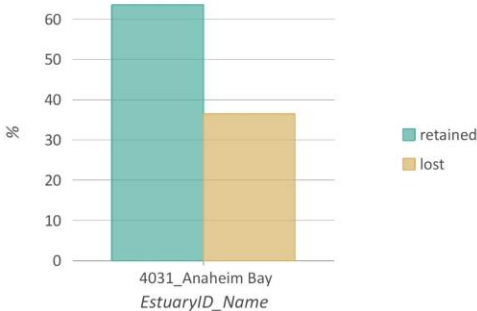
Anaheim Bay (Estuary ID: 4031)



PMEP Region: Southern California Bight
CMECS Physiographic Setting: Embayment/Bay

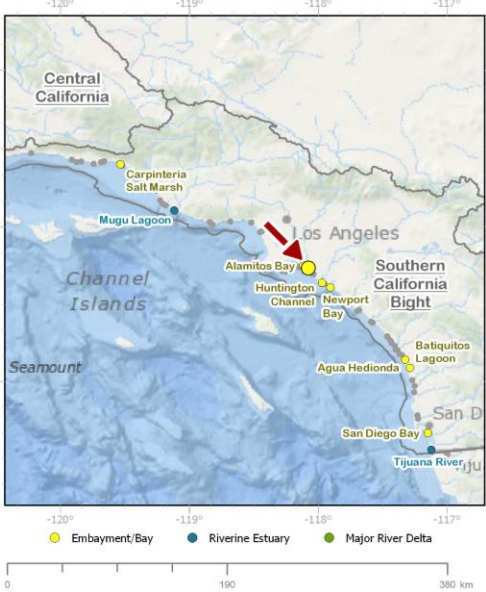
Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost



* includes emergent, scrub-shrub and forested veg. classes

Retained = 265.9 ha (63.5%)
Lost = 152.7 ha (36.5%)
Estuary Extent = 763 ha
Last NWI Update = 2005



Outline

1. Methods
2. Results
- 3. Limitations of the analysis**
4. Comparison to other data
5. Significance
6. Recommended uses
7. Data gaps / burning questions

Limitations of the analysis

Limitations relate to the source data.

For example, for the NWI:

- Wetland mapping and classification are based on remote data
- Scale is 1:24,000
- Represents a point in time (so data may be outdated)
- No clear path for user input
- Details on NWI methods are here:

<https://www.fws.gov/wetlands/documents/Data-Collection-Requirements-and-Procedures-for-Mapping-Wetland-Deepwater-and-Related-Habitats-of-the-United-States.pdf>

Limitations of the analysis

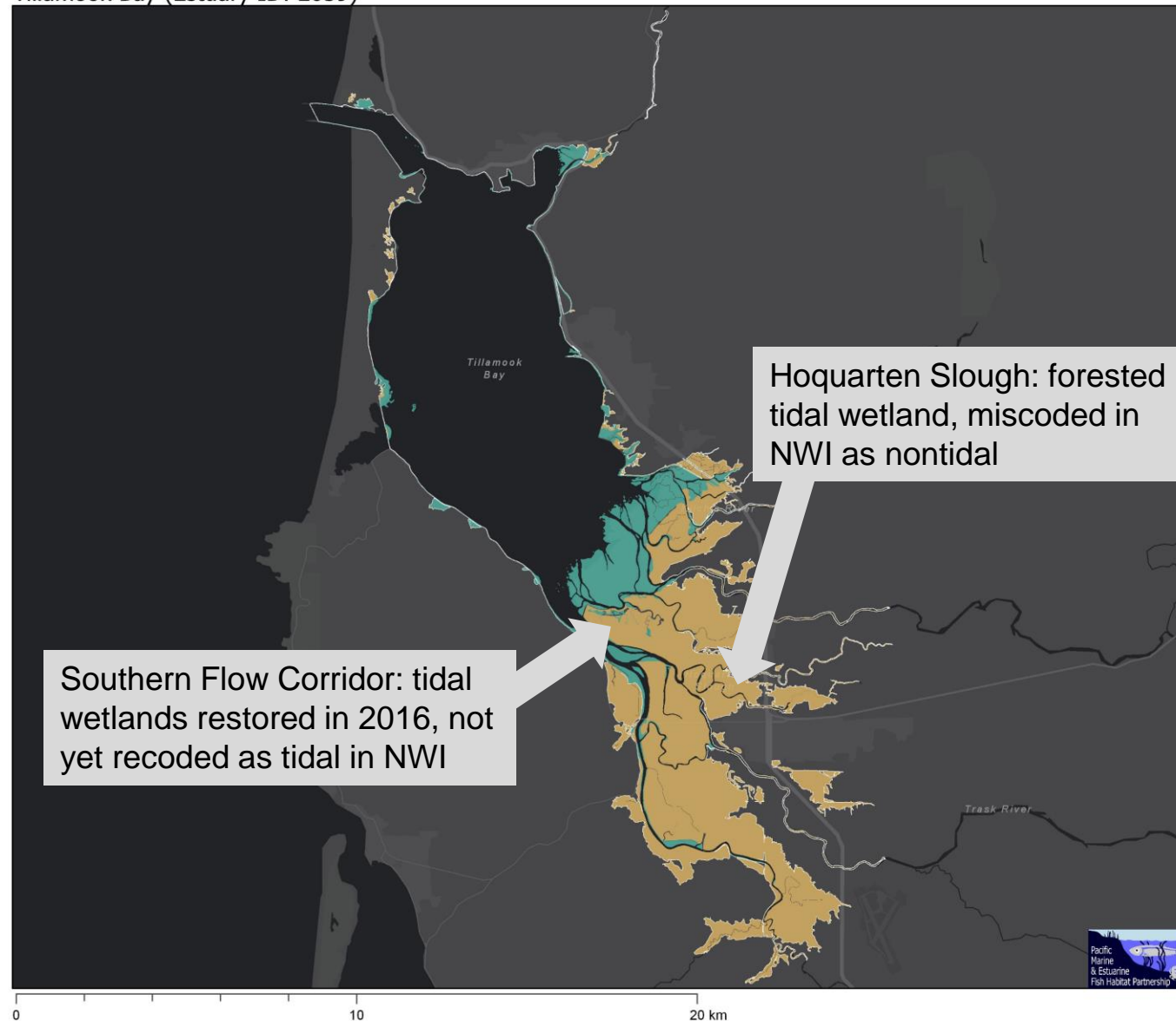
Two main types of known errors related to NWI source data:

Type 1. NWI fails to identify existing tidal wetlands

- Result: overestimate of loss
- Common examples: upper estuary (especially forested tidal wetlands); recent restoration projects

NWI Type 1 error examples: Tillamook Bay

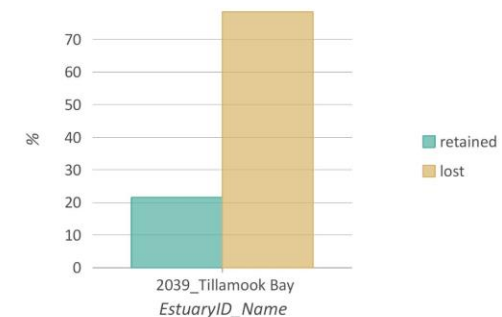
Tillamook Bay (Estuary ID: 2039)



PMEP Region: Washington, Oregon, Northern California Coast
CMECS Physiographic Setting: Riverine Estuary

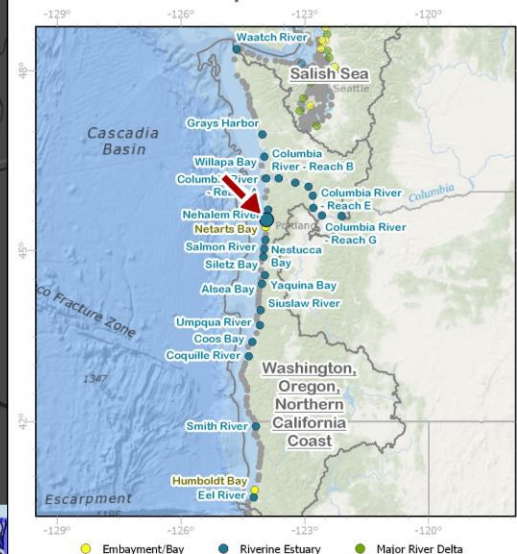
Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost



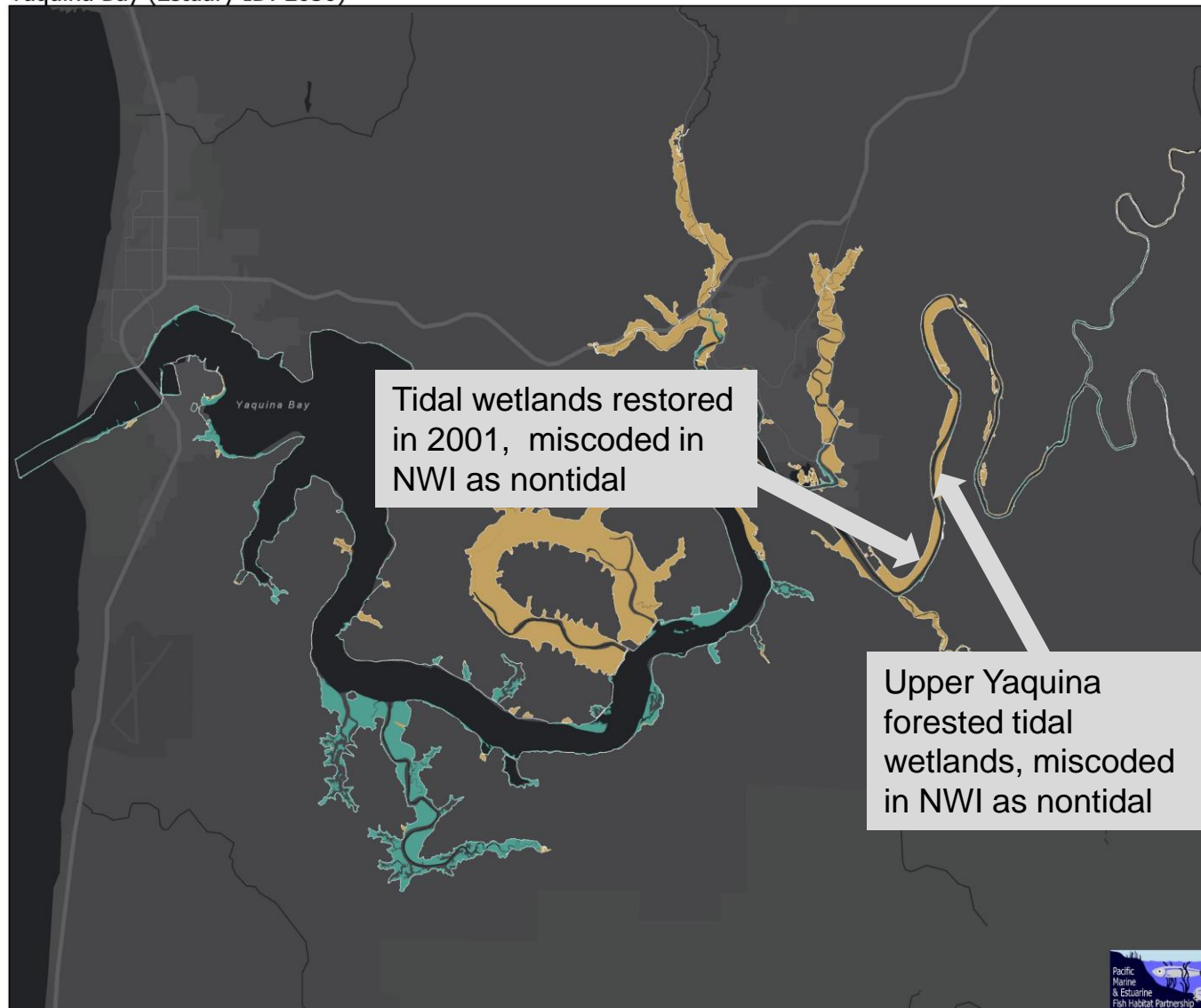
* includes emergent, scrub-shrub and forested veg. classes

Retained = 494.2 ha (21.6%)
Lost = 1,797.9 ha (78.4%)
Estuary Extent = 5,677.1 ha
Last NWI Update = 2000



NWI Type 1 error examples: Yaquina Bay

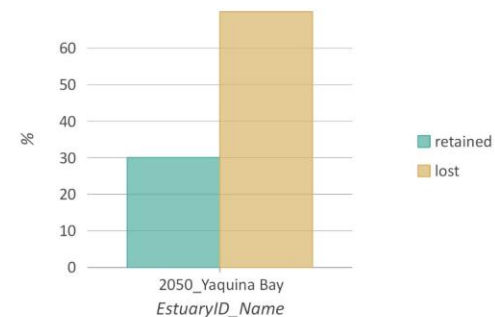
Yaquina Bay (Estuary ID: 2050)



PMEP Region: Washington, Oregon, Northern California Coast
CMECS Physiographic Setting: Riverine Estuary

Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost



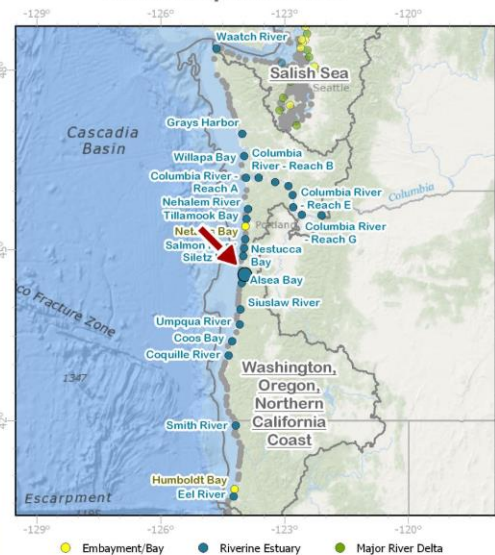
* includes emergent, scrub-shrub and forested veg. classes

Retained = 295.3 ha (30%)

Lost = 687.8 ha (70%)

Estuary Extent = 2,690.9 ha

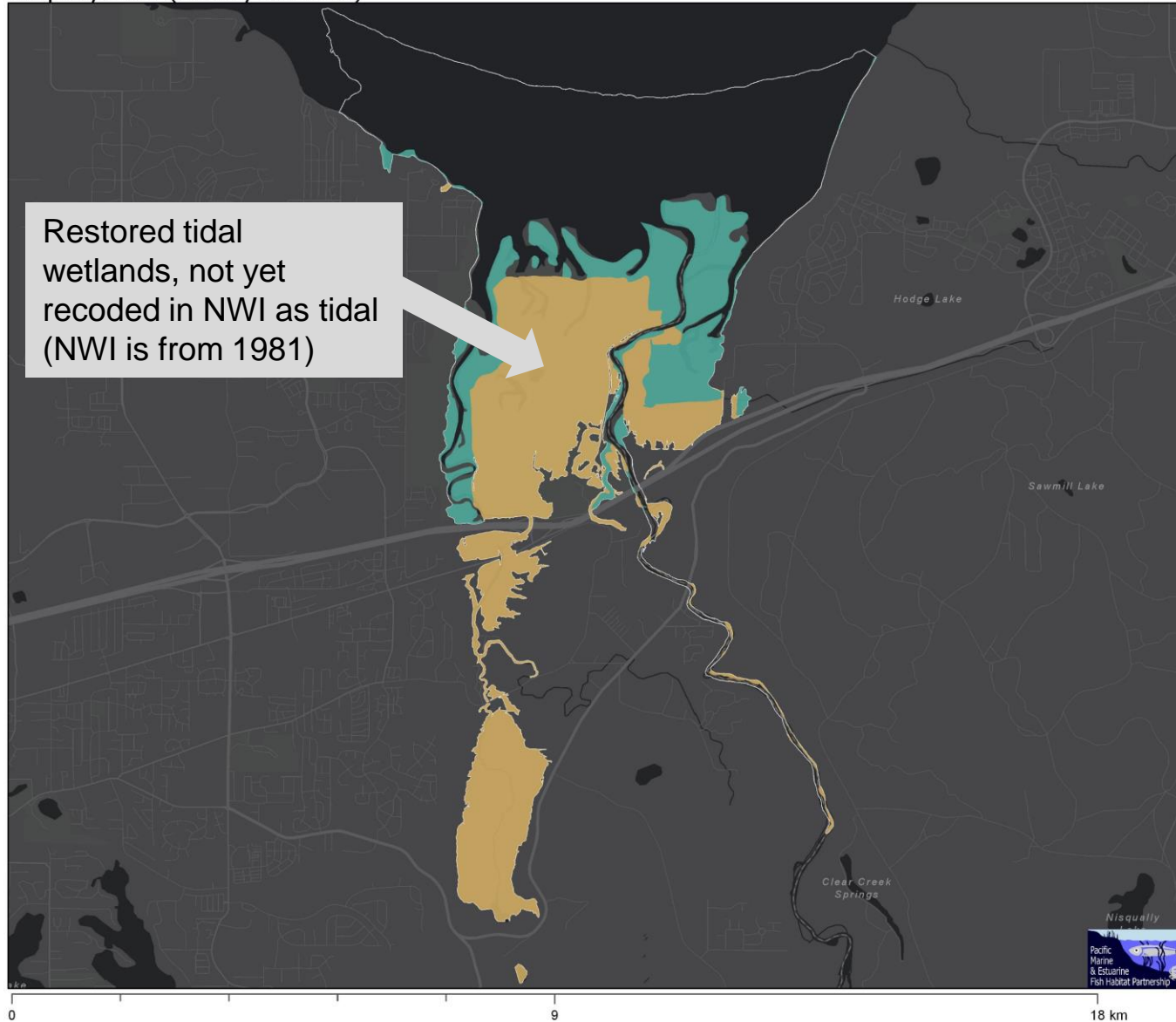
Last NWI Update = 2010



NWI Type 1 error example: Nisqually River

Nisqually River (Estuary ID: 1082)

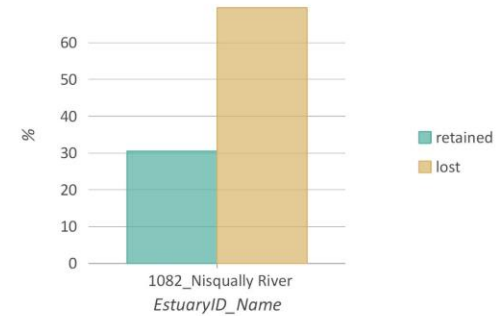
Restored tidal wetlands, not yet recoded in NWI as tidal (NWI is from 1981)



PMEP Region: Salish Sea
CMECS Physiographic Setting: Major River Delta

Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost



* includes emergent, scrub-shrub and forested veg. classes

Retained = 298.9 ha (30.5%)

Lost = 680.3 ha (69.5%)

Estuary Extent = 1,968.6 ha

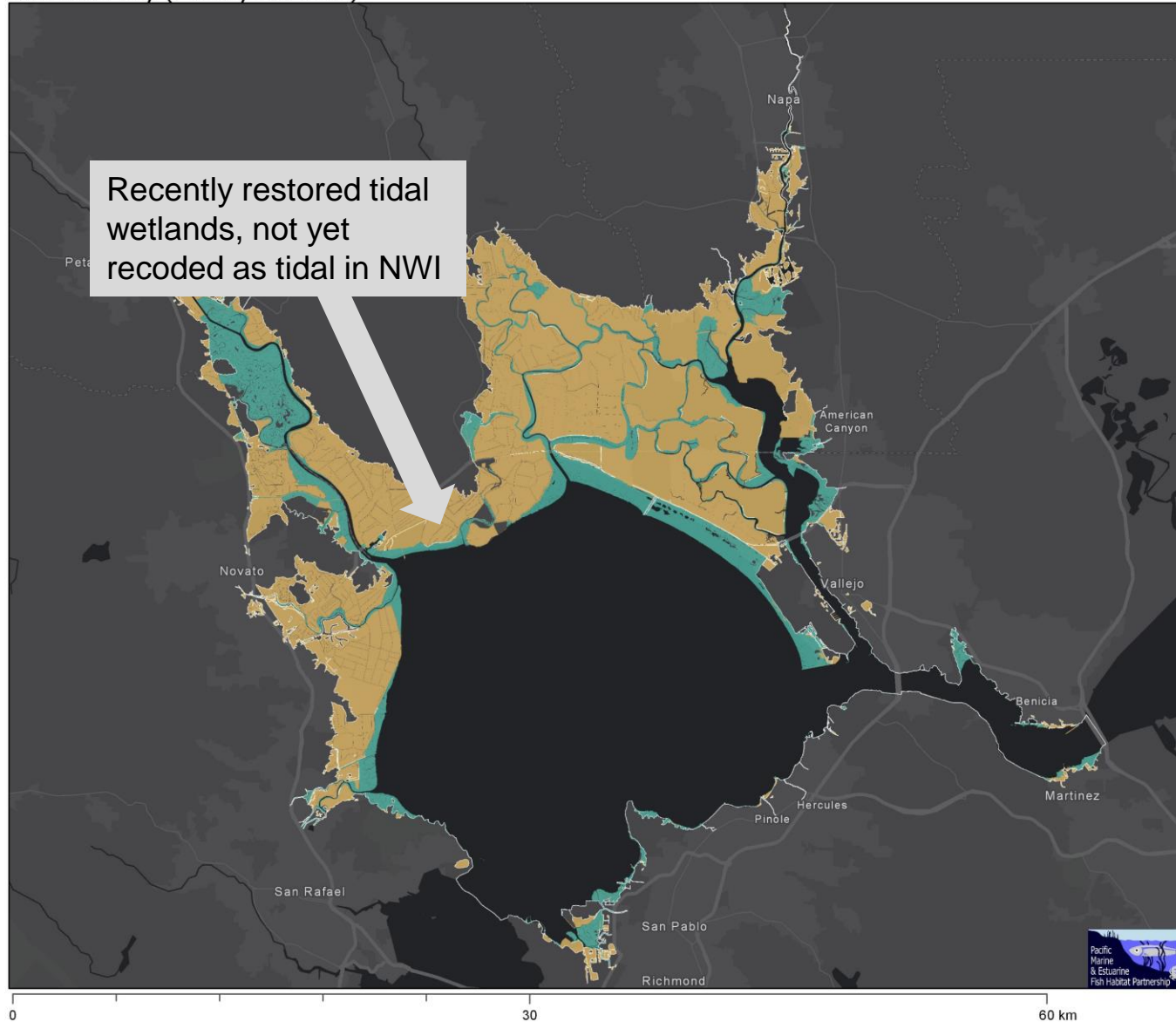
Last NWI Update = 1981



NWI Type 1 error example: San Pablo Bay

San Pablo Bay (Estuary ID: 3047)

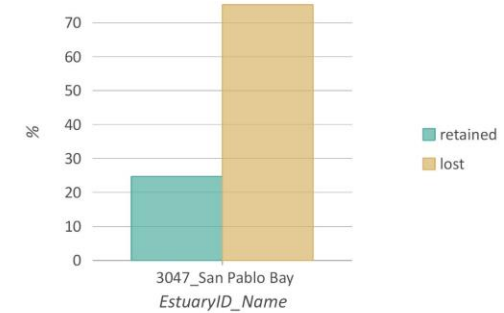
Recently restored tidal wetlands, not yet recoded as tidal in NWI



PMEP Region: Central California
CMECS Physiographic Setting: Embayment/Bay

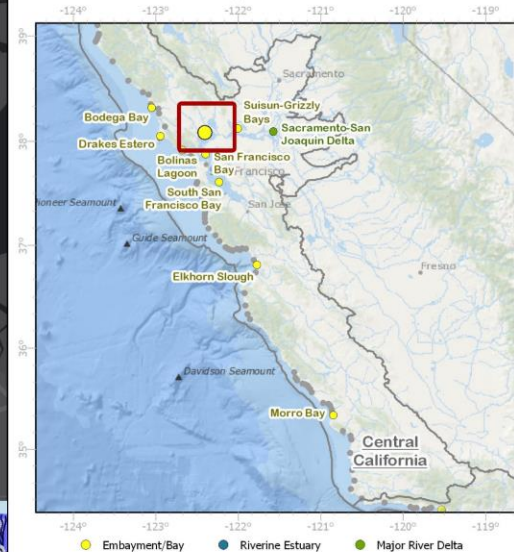
Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost



* includes emergent, scrub-shrub and forested veg. classes

Retained = 6,185 ha (24.7%)
Lost = 18,831.2 ha (75.3%)
Estuary Extent = 57,510.4 ha
Last NWI Update = 2009



Limitations of the analysis

Two main types of known errors related to NWI source data:

Type 2. NWI identifies an area as tidal that is disconnected

- Result: underestimate of loss
- Uncommon

In some cases NWI data are quite old (>20 yrs).

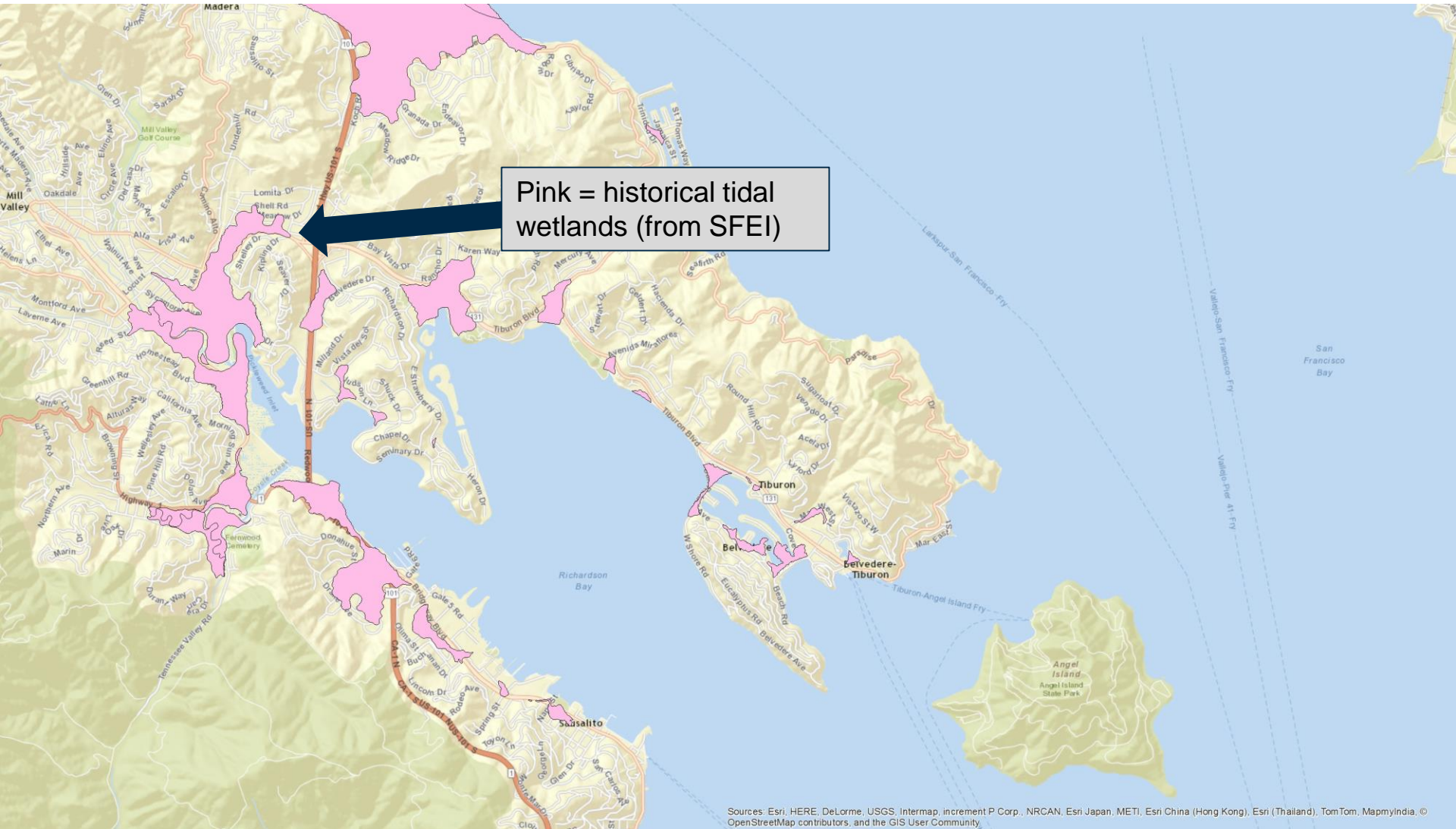
Limitations of the analysis

Two types of known errors related to Estuary Extent data:

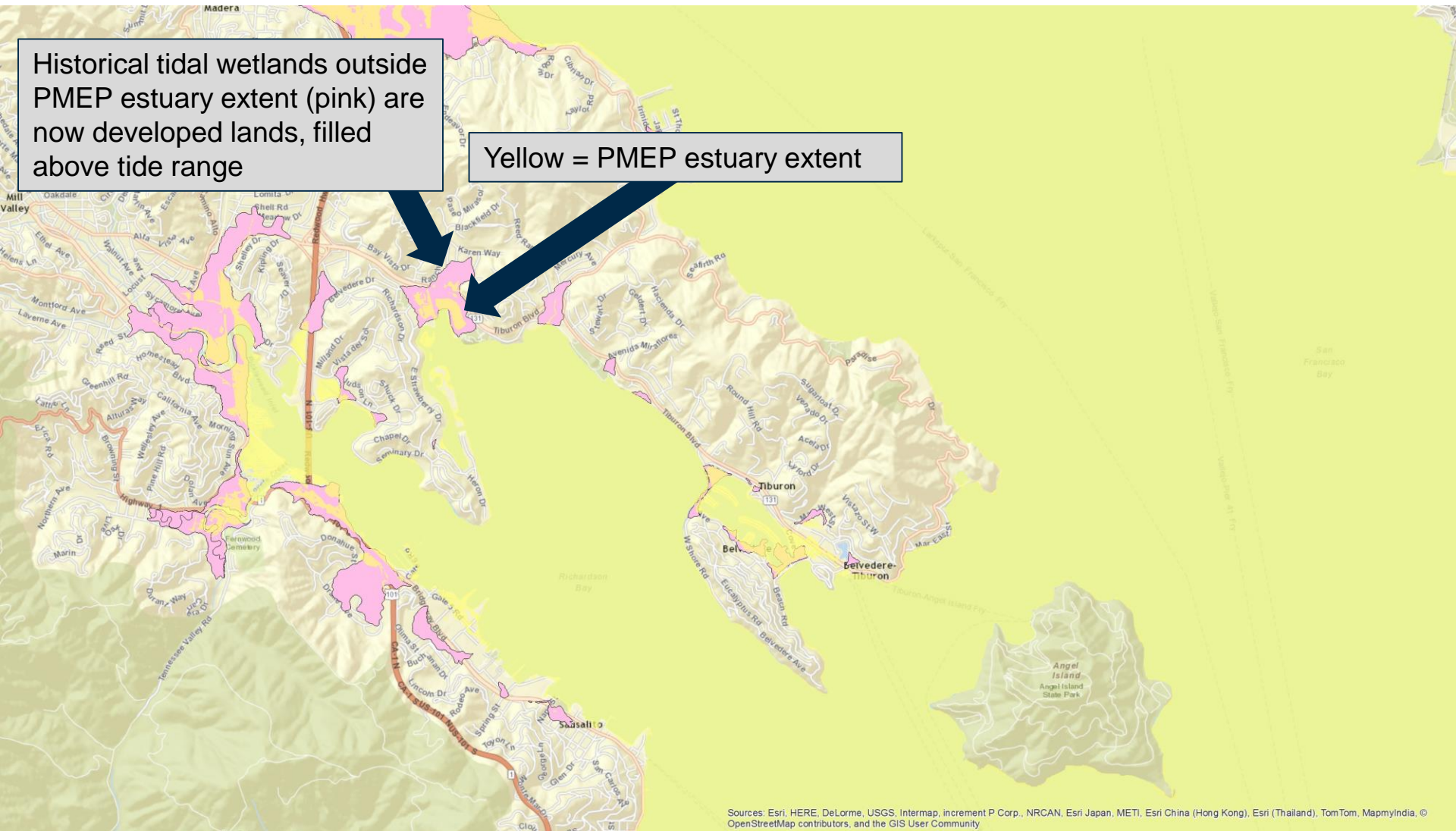
Type 1. Estuary Extent data underestimates historical extent of tidal wetlands

- Result: underestimate of loss
- Common example: filled and developed areas

Estuary Extent Type 1 error example: Richardson Bay



Estuary Extent Type 1 error example: Richardson Bay



Estuary Extent Type 1 error example: L.A. Harbor



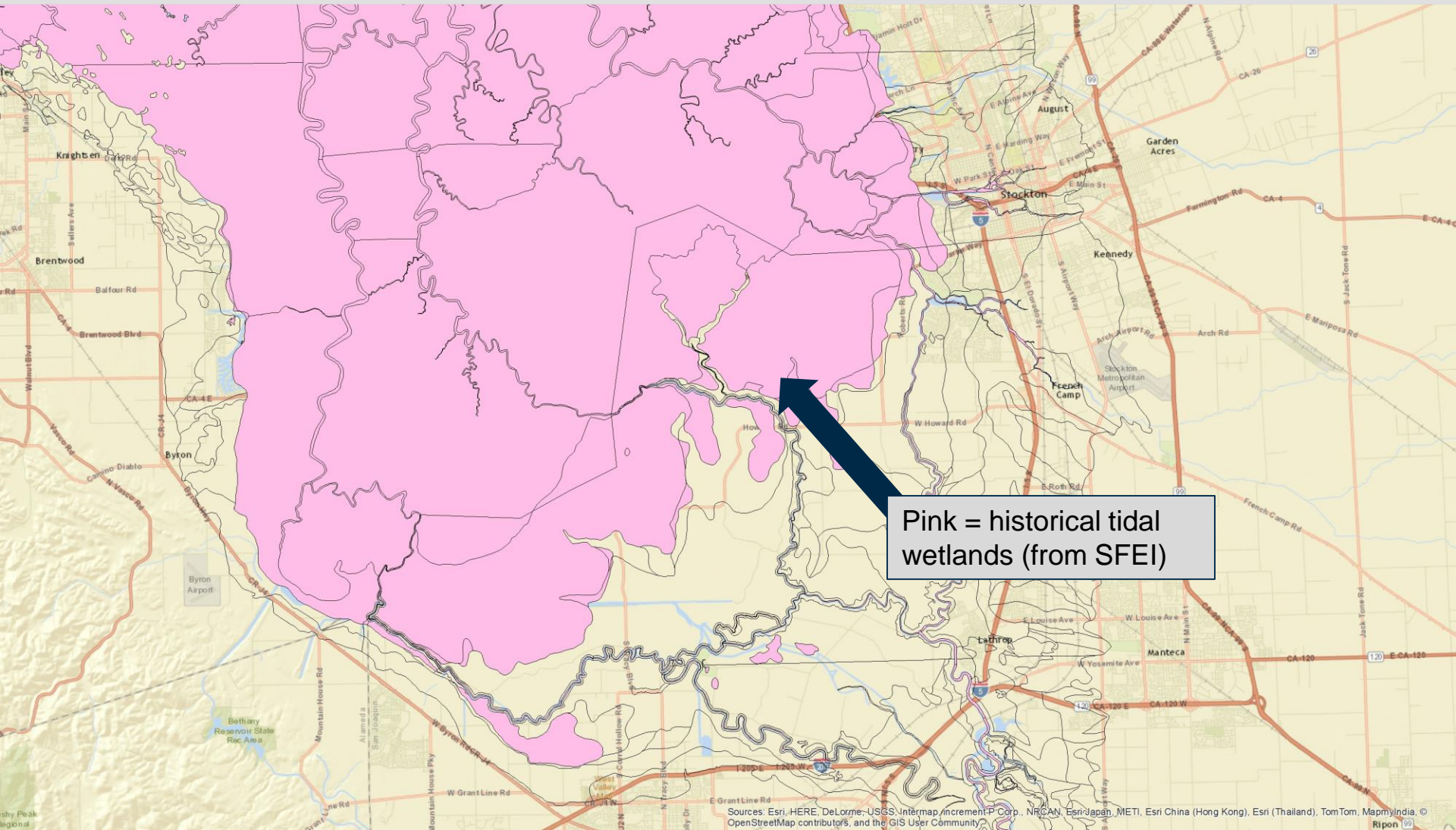
Limitations of the analysis

Two types of known errors related to Estuary Extent data:

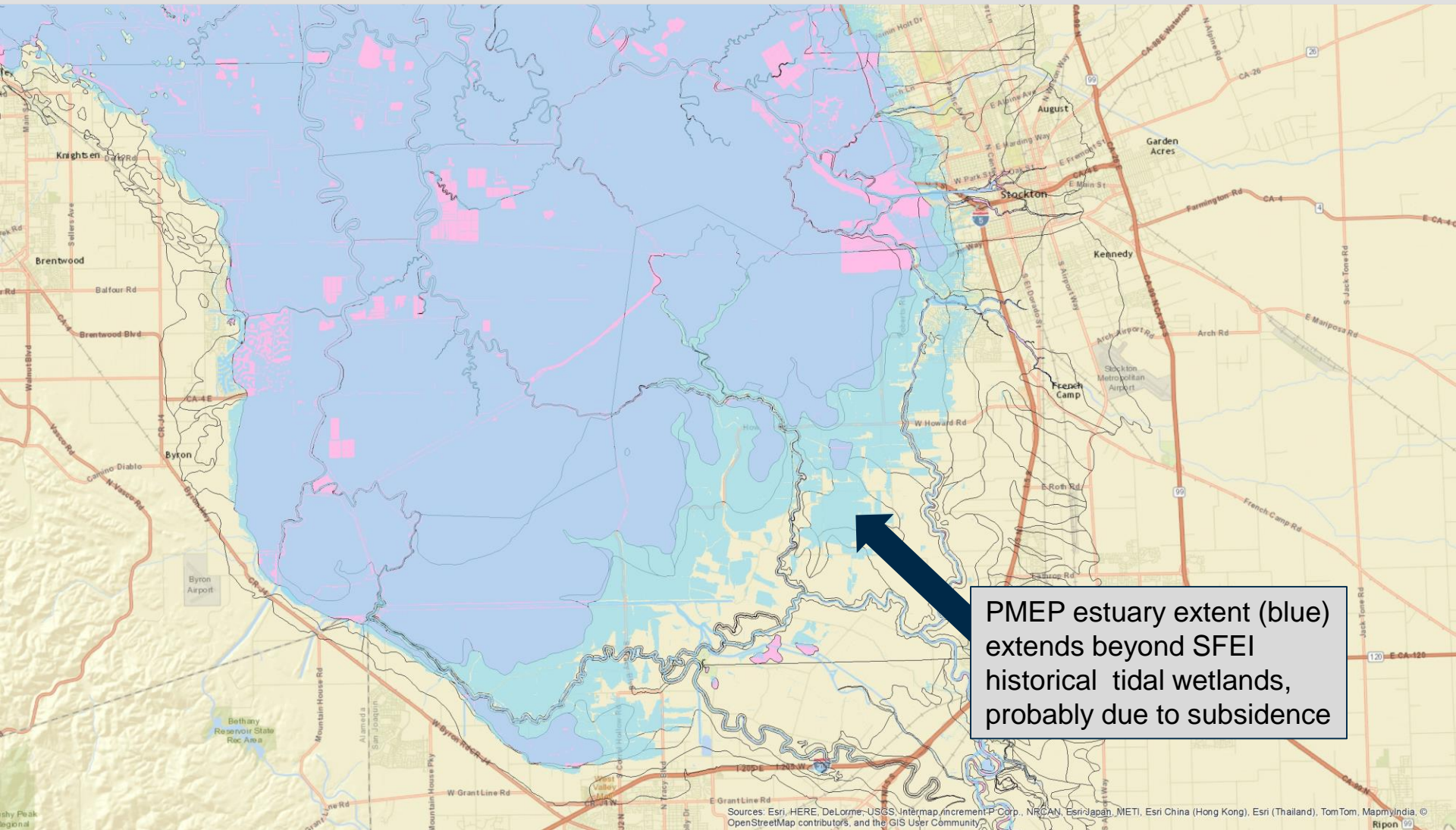
Type 2. Estuary Extent data overestimates historical extent of tidal wetlands

- Result: overestimate of loss
- Rare, based on our field work
- Possible for very subsided diked lands (e.g. south Sacramento-San Joaquin delta)

Estuary Extent Type 2 error example: Sacramento-San Joaquin Delta



Estuary Extent Type 2 error example: Sacramento-San Joaquin Delta

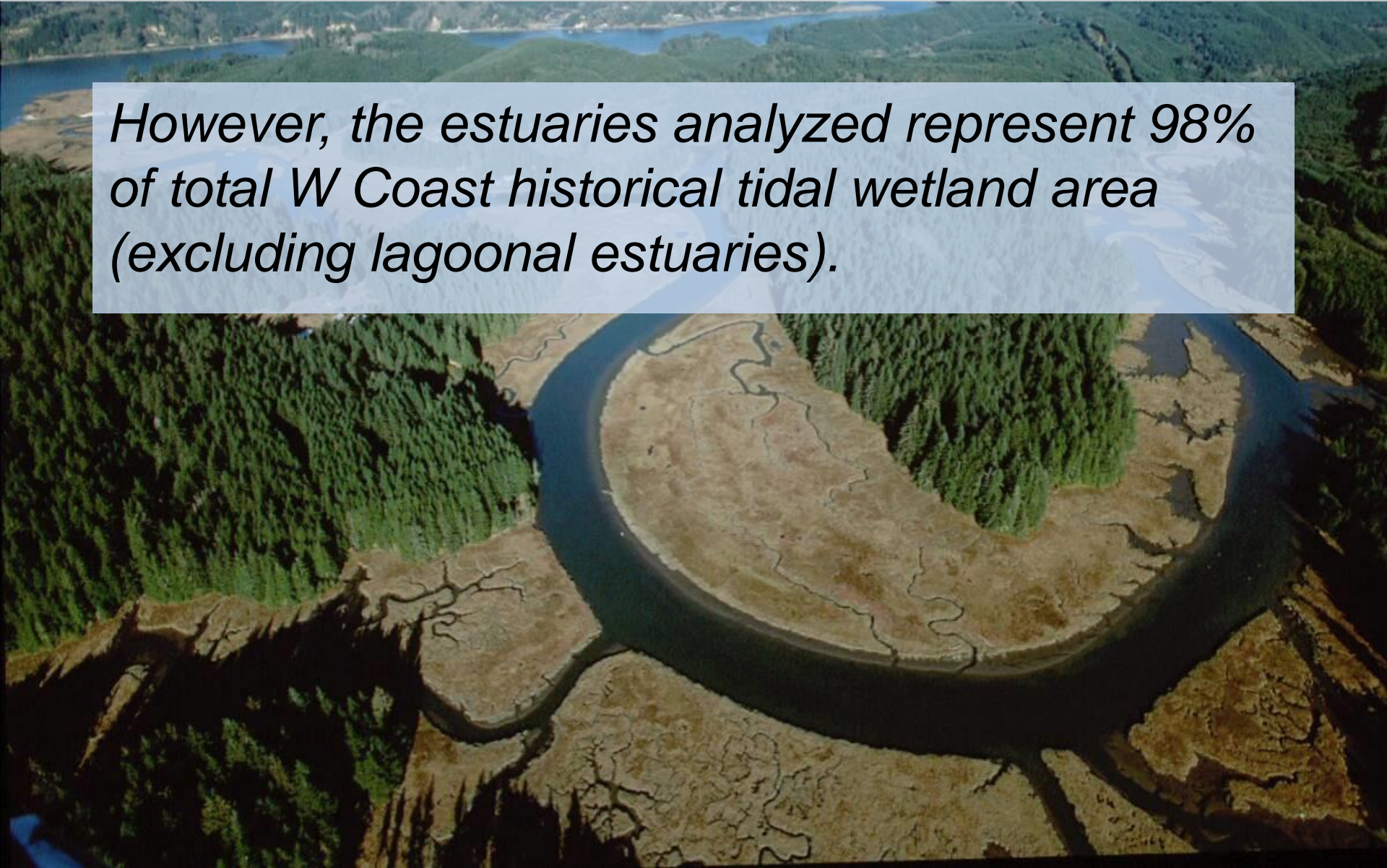


Limitations of the analysis

- Lagoonal estuaries (omitted)
- 214 small estuaries were omitted from analysis:
 - Few major alterations
 - Few or no tidal wetlands mapped in NWI
 - Scale of alterations too small for NWI

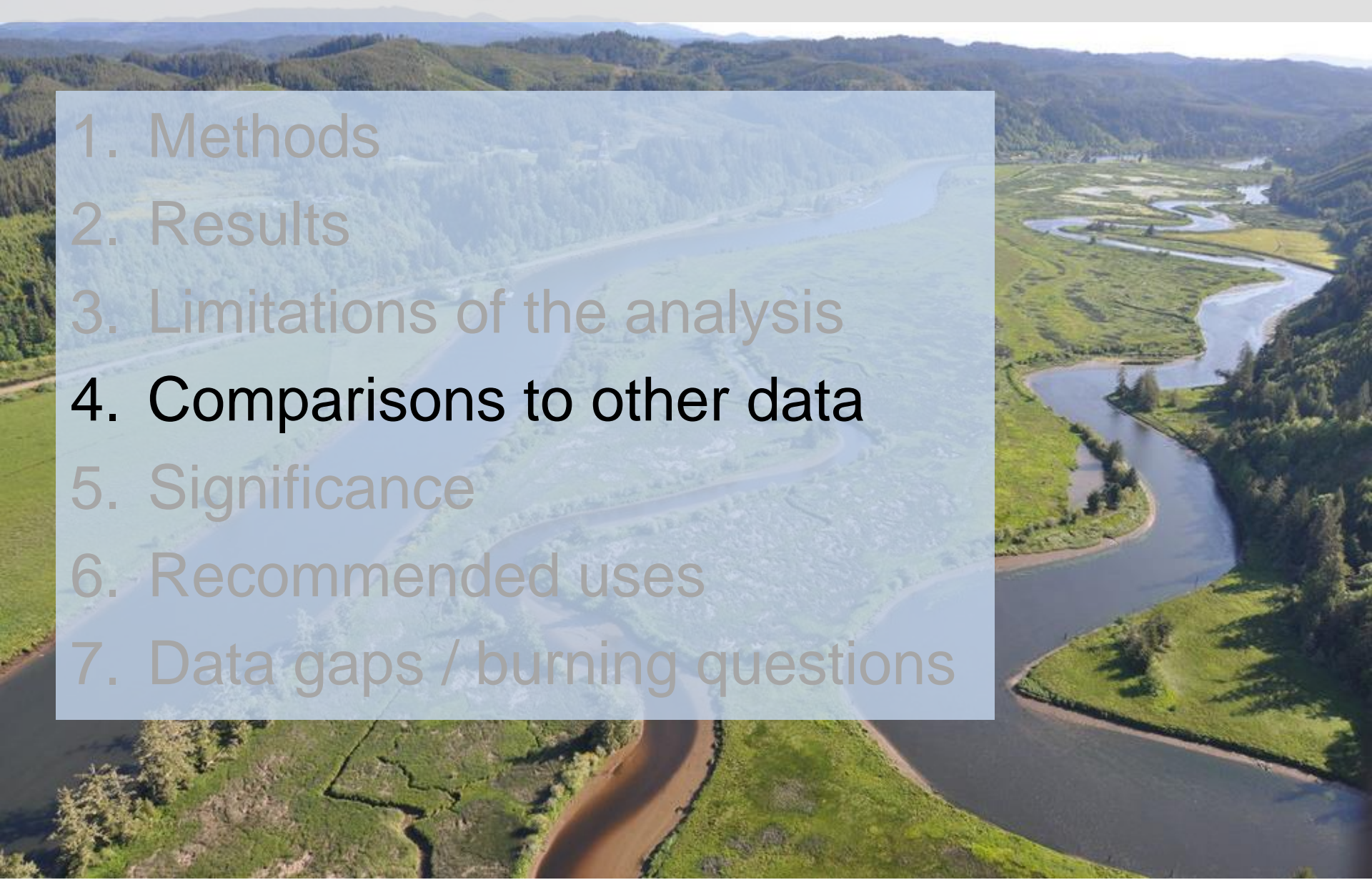
Limitations of the analysis

However, the estuaries analyzed represent 98% of total W Coast historical tidal wetland area (excluding lagoonal estuaries).

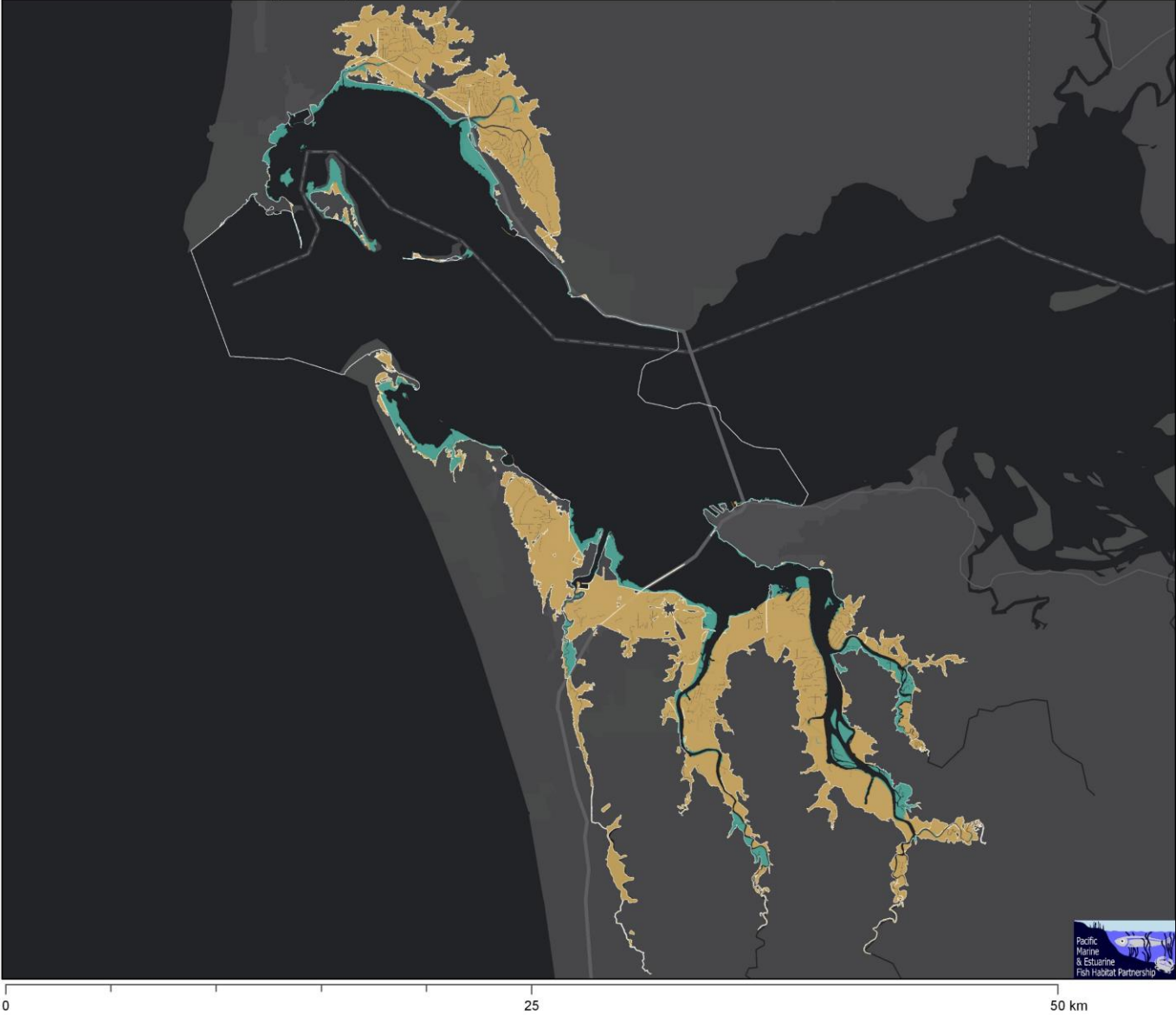


Outline

1. Methods
2. Results
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- 4. Comparisons to other data**
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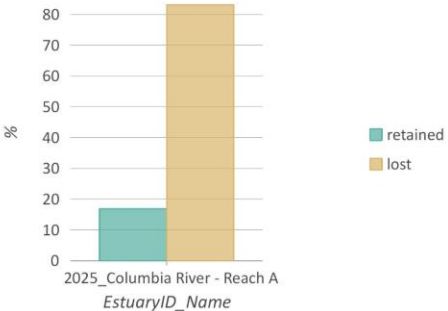
Columbia River - Reach A (Estuary ID: 2025)



PMEP Region: Washington, Oregon, Northern California Coast
CMECS Physiographic Setting: Riverine Estuary

Note that not all PMEP estuaries were part of the assessment.

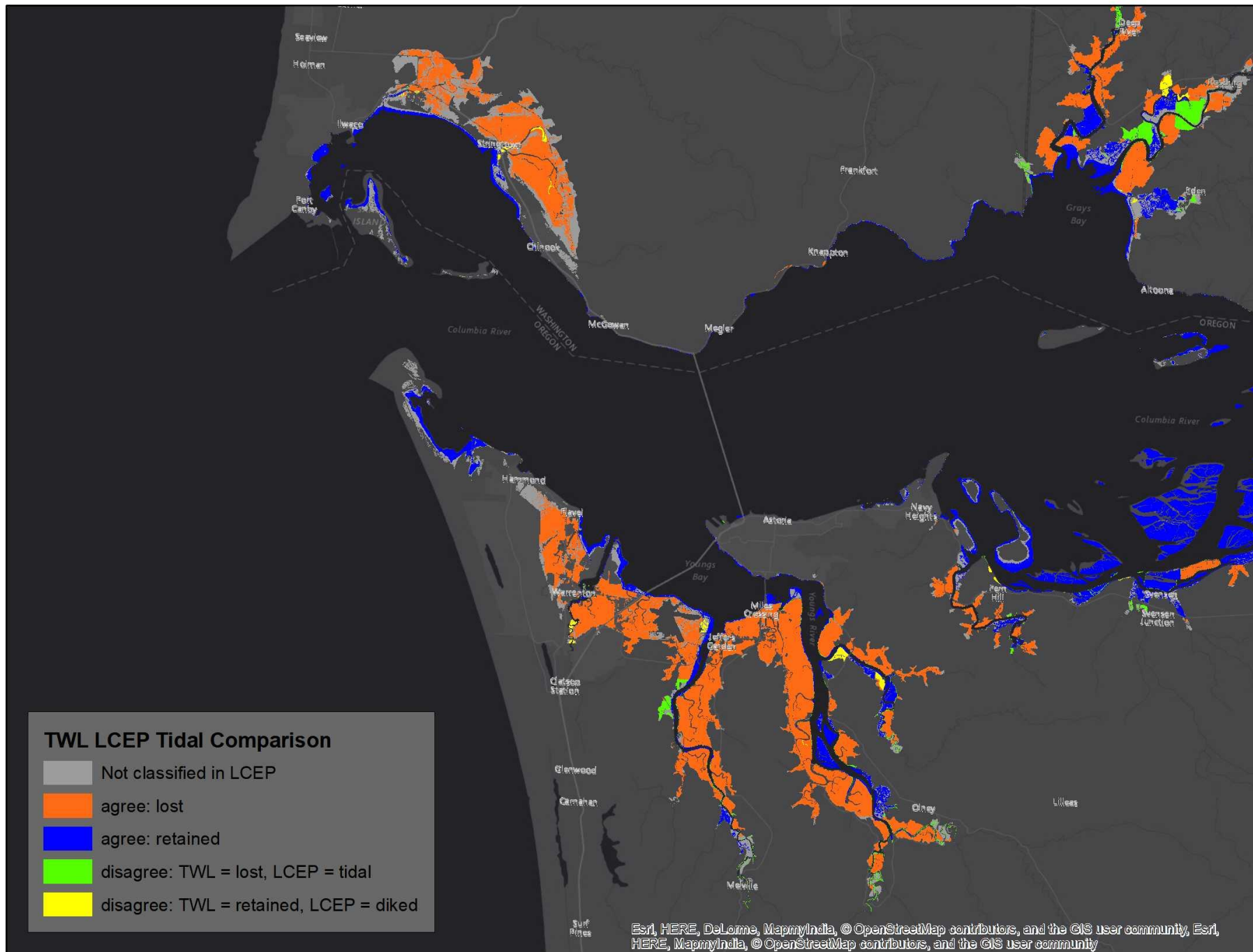
Vegetated Tidal Wetlands* - Retained vs. Lost



* includes emergent, scrub-shrub and forested veg. classes

Retained = 1,063 ha (16.9%)
Lost = 5,228 ha (83.1%)
Estuary Extent = 20,903.9 ha
Last NWI Update = 2011





Comparisons to other data

Comparison to Lower Columbia River Estuary Partnership's Tidally Impaired Lands layer:

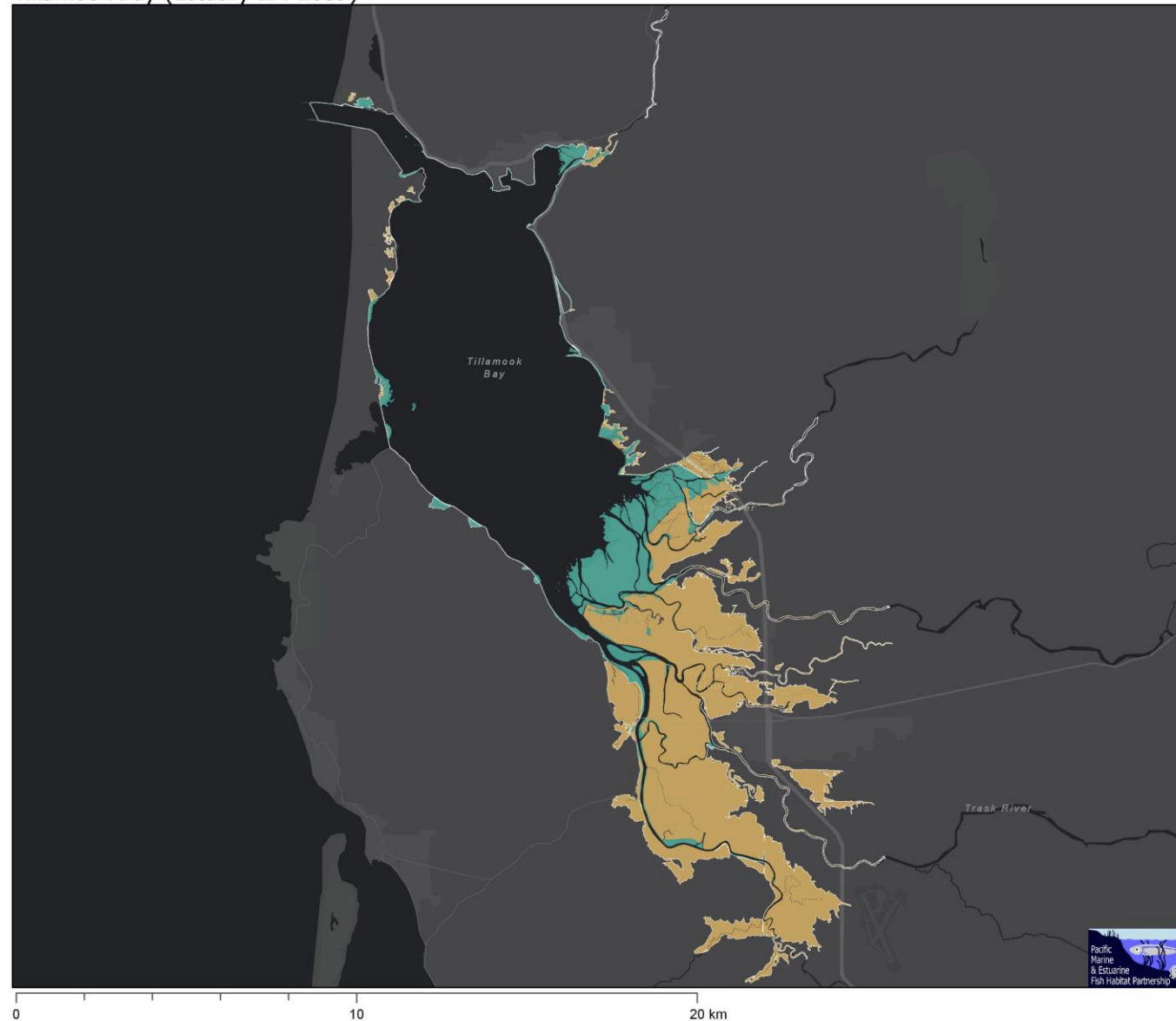
- Agree (lost/diked) ~ 67.2%
- Agree (retained/tidal) ~ 26.4 %
- Disagree (TWL = lost, LCEP = tidal) ~ 5.7%
- Disagree (TWL = retained, LCEP = diked) ~ 0.7 %
- Overall: 93.6 % agreement

Comparisons to other data

- Comparison to Oregon's CMECS diked areas mapping: *Underway*
- OR CMECS is in Phase 2
 - Refining mapping of diked/disconnected areas with estuary-specific data
 - Differences will be useful to both PMEP and OR-DLCD
 - Comparison to Oregon's CMECS diked areas mapping: *Underway*
- Comparisons to PSNERP and SFEI wetland loss mapping: *Underway*

Comparisons to other data: Oregon CMECS

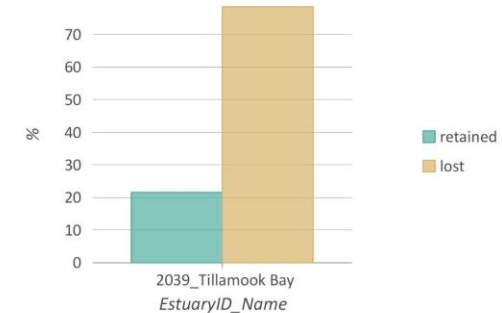
Tillamook Bay (Estuary ID: 2039)



PMEP Region: Washington, Oregon, Northern California Coast
CMECS Physiographic Setting: Riverine Estuary

Note that not all PMEP estuaries were part of the assessment.

Vegetated Tidal Wetlands* - Retained vs. Lost



* includes emergent, scrub-shrub and forested veg. classes

Retained = 494.2 ha (21.6%)

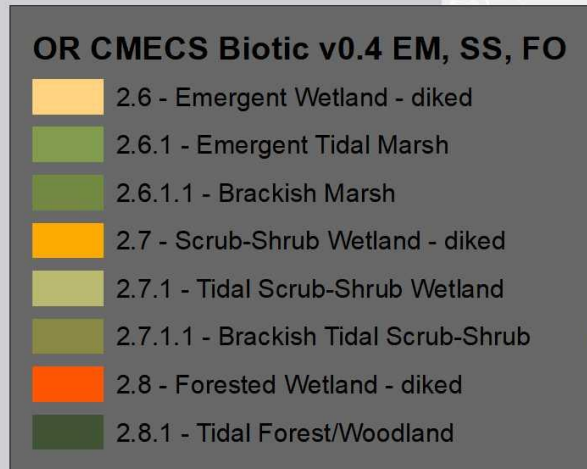
Lost = 1,797.9 ha (78.4%)

Estuary Extent = 5,677.1 ha

Last NWI Update = 2000



Comparisons to other data: Oregon CMECS



Results

1. Methods
2. Results
3. Limitations of the analysis
4. Comparison to other data
5. **Significance**
6. Recommended uses
7. Data gaps / burning questions

Significance

- First West Coast-wide analysis of tidal wetland losses
- Leverages PMEP's estuary extent mapping
- Sets the stage for next steps:
 - Address losses by habitat class
 - Refine data on disconnected areas
 - Solicit community input on restored areas
 - Analyze potential climate change/SLR impacts

Outline

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Recommended uses

In our report, we'll provide recommended uses:

*“This project’s results provide useful comparisons at broad scales (e.g. across estuaries), but the data should **not** be used for site-specific assessment.”*

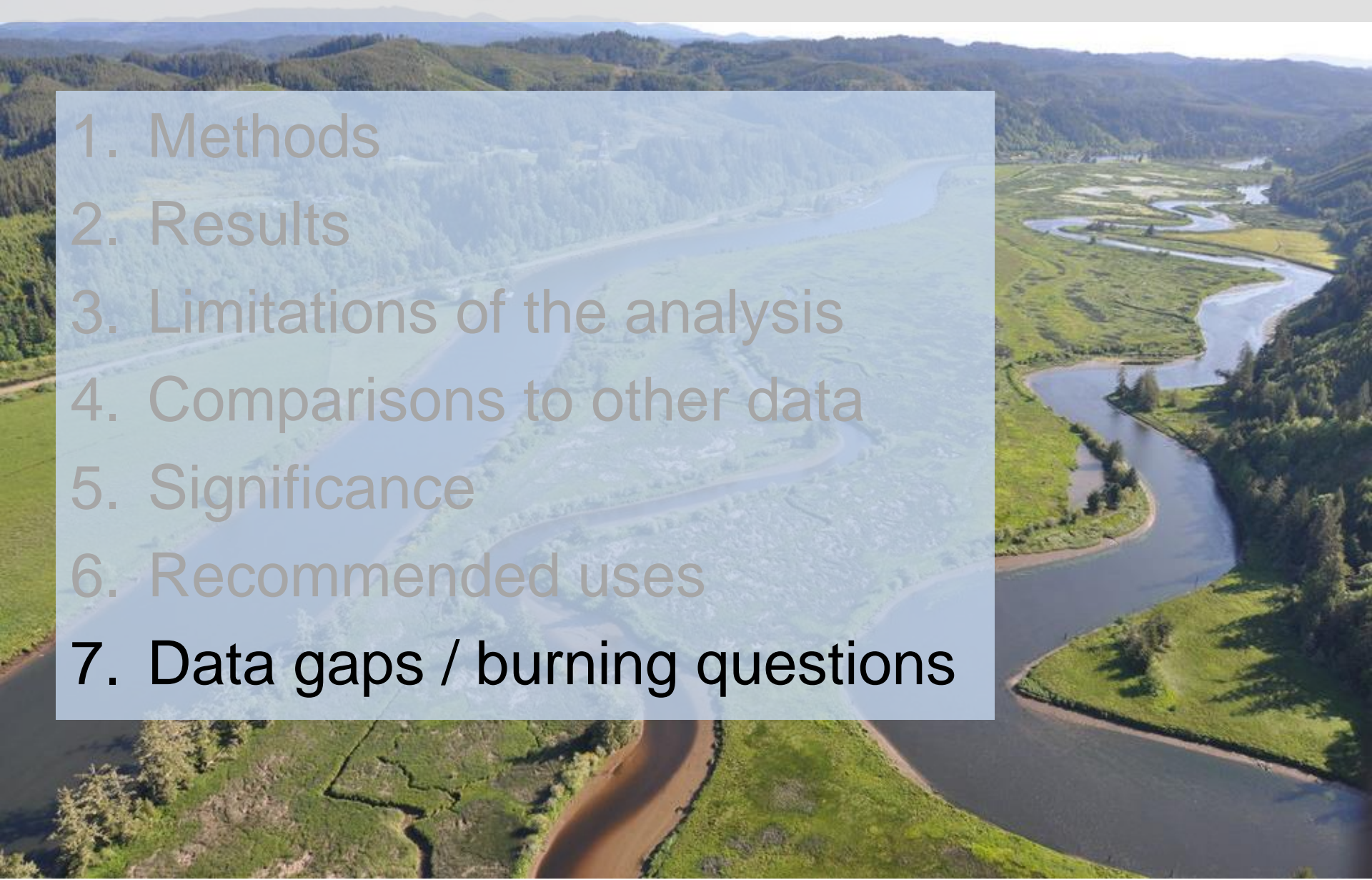
Other recommended uses and interpretive guidance: your input is important!

Recommended uses: Review process

- Goals for PMEP review:
 - Develop familiarity with data
 - Assist with outreach approach
 - Get feedback on significance and uses
- Online map review
- Input much appreciated!

Outline

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Data gaps / burning questions

An aerial photograph of a river winding through a lush green landscape. The river flows from the upper left towards the lower right, with several meanders. The surrounding area is covered in dense green forests and grassy fields. In the background, rolling hills and mountains are visible under a clear sky. Overlaid on the image is a diagram consisting of two light blue rectangular boxes. The top box contains the text 'Improved data' and the bottom box contains 'Action guidance'. A white arrow points from the bottom of the top box to the top of the bottom box.

Improved data

Action guidance

Data gaps / burning questions

Improved data:

1. Diked/disconnected areas
2. Restored areas
3. Revised/updated NWI

Action guidance:

1. Prioritization of restoration/conservation actions
 - By habitat class (need historical veg mapping... next presentation)
 - By estuary zone
 - Others?

An aerial photograph of a river delta, likely the Willamette River, showing a complex network of channels and islands. The land is a mix of green forest and brown, exposed sediment. A semi-transparent rectangular box is overlaid on the top portion of the image, containing the text.

Thank you for listening! Questions?

Laura Brophy

541-752-7671

brophyonline@gmail.com

Estuary Technical Group

Institute for Applied Ecology, Corvallis, OR

and

Marine Resource Management Program

College of Earth, Ocean and Atmospheric Sciences

Oregon State University